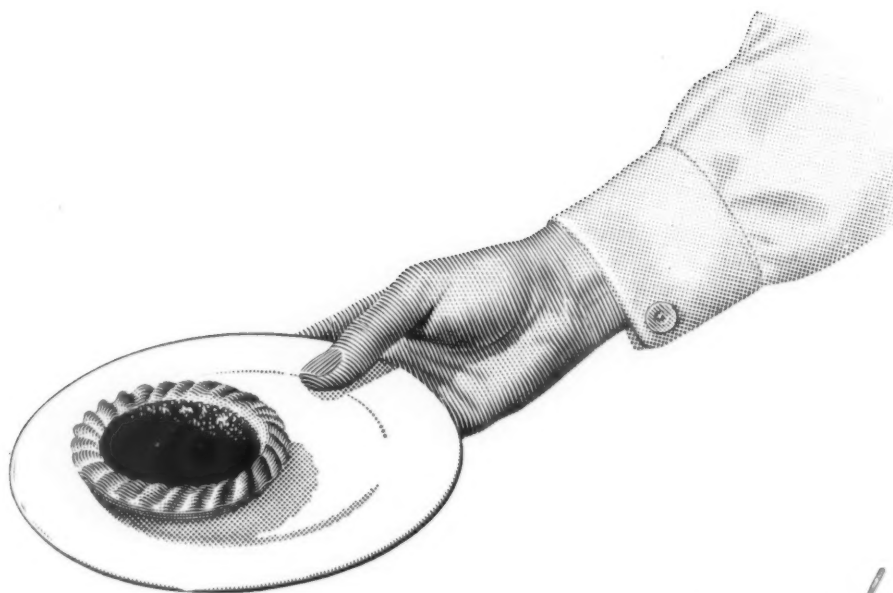




THE ARCHITECTURAL REVIEW VOLUME CXIII NUMBER 677 MAY 1953 FIVE SHILLINGS



I said "lamb's heart" miss!

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THE ARCHITECTURAL REVIEW

Volume 113 Number 677 May 1953



On the cover a view up the garden steps of the Casa Daniel at Laranjeiras, Brazil, reveals a wall transformed by the art of Roberto Burle-Marx from an oppressive area of dead masonry, crushing a narrow patio, into an active participant with the foliage and the sunlight in a brilliant garden composition. There could be no more powerful reminder than this pattern of *azulejos* that the function of a mural is not to decorate a wall but to render it eloquent—a lesson which may not have been fully driven home by the present exhibition of murals at the RIBA.

282 Frontispiece

283 Against the Steamroller by Frank Lloyd Wright, with commentary by J. M. Richards Asserting that buildings have positive meaning, even political meaning, Mr. Wright examines the contemporary architectural scene in USA and finds most of what he sees inimical to his own conception of democracy. He finds 'collectivism' widely preached in 'learning factories,' and while he admits the usefulness of team-work in its proper place, he feels that the original conception is not that place—that, he feels, is architecture 'rewritten Soviet-wise,' and he sums up his apprehensions by insisting that culture should be home grown, and that the teaching of art is not the business of the scientist. In his comments on this, Mr. Richards questions the use of political labels too rigidly applied, and underlines the difference between the present architectural practice of the Soviet countries and the committee-designed monuments of the International style, drawing attention to the specifically American features which that style has developed in USA. To the organic, emotional and individualistic architecture which Mr. Wright's genius alone can justify, he opposes the intellectual, standardizing and internationalist bias necessary in training lesser men, and insists that his remarks should be taken by science and the academies as a challenge to show what they can do for individual expression.

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286 Preview: Offices at Poole, Dorset, Farmer and Dark: Architects. Colleges of Further Education in Lancashire, G. Noel Hill: County Architect. House at Dar-es-Salaam, Ernst May: Architect

291 Sinan by Spencer Corbett Among the world's great architects Mimar Sinan is one of the least known, and outside Turkey the historical and aesthetic significance of his work is hardly understood. In this article Mr. Corbett sets out the facts, as far as they are known, about his life and work, and analyses the characteristics of his chief buildings. Because of a similarity of external silhouette, Sinan's great mosques of the Suleimanic epoch are usually dismissed as variants of Aghia Sofia, but Mr. Corbett is able to show that the functional requirements of the mosque, and its relationship to the forecourt, produced plan-types which are quite 'un-basilican in intention, and that Sinan uses the half domes and buttresses of the byzantine repertoire to produce radically different layouts. His art developed in the increasingly subtle relationships he was able to produce between the bulk of the domed prayer-hall and the hollow of the forecourt, and in the complete confidence and success with which he employed visual sleight-of-hand and structural falsifications to obtain his effects.

299 African Experiment by Maxwell Fry The curious historical development of the Gold Coast, some of it unflattering to the white races, some of it to their credit, has resulted in the unplanned growth of an education system depending largely on the various missionary organizations which have been active there, and it is only recently that schools and training colleges have been brought within a unified scheme, providing for a general expansion of the educational services. This expansion, as Mr. Fry points out, has brought with it considerable changes in the West African building industry, not only in materials and constructional methods, but also in tendering and forms of contract, and, beyond this, in overall conceptions of planning, siting and adaptation of buildings to climate.

301 Recent Educational Buildings in the Gold Coast Fry, Drew and Partners: Architects

311 Space Heaters by Neville Ward Recent technical advances which have given us more efficient room heaters operating by oil, gas or electricity have yet to be matched by comparable aesthetic developments. A natural unwillingness to forgo the visual pleasures of the open fire, planning concepts which treat the heat source as the focus of the

room, and a high degree of conservatism, have combined to inhibit the solution of the aesthetic problems of the space heater, and the most that can be said of the best of them is that they are innocuous. Design development has been very slow and some of the models which were brought to Mr. Ward's attention for inclusion in this Design Review as recent developments had already appeared in a previous survey published in 1946.

316 Current Architecture

321 Interior: Irish Embassy, London Raymond McGrath: Architect, Office of Public Works, Dublin

325 Interior: Headquarters for a Trade Federation R. D. Russell: Designer

Miscellany

329 Books

331 History

333 World

333 Indoor Plant

333 Townscape

336 Design Review

337 Anthology

337 Marginalia

338 Intelligence

338 Correspondence

338 Exhibitions

340 Trade and Industry

342 Contractors, etc.

346 Acknowledgments

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THE ARCHITECTURAL REVIEW

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FIVE SHILLINGS



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 Designing for the tropics is a new skill increasingly required of British architects, and Gordon Cullen here gives his impression of a typical work, at Adisadel on the Cape Coast, by Fry, Drew and Partners, whose recent West African buildings are illustrated and discussed in detail on pp. 298-310.

The survival of quality and individual feeling in an age which inevitably thinks in terms of quantity production and rule-of-thumb solutions is a matter that exercises the minds of all who worry about the way architecture is going. Frank Lloyd Wright, who has always championed the individual against the steamroller, and J. M. Richards contribute below their thoughts on this subject, with Wright leading and Richards commenting.

AGAINST THE STEAMROLLER

Frank Lloyd Wright

Architecture is the mother-art. Its *national* value lies in its natural value. No architectonic construction can exist outside the realm of significance whether so intended or not. Significance may be haphazard or conceived with vision but whatever it implies is always there to be read by human intelligence. The significance of certain buildings would, therefore, be either communist, fascist, or democratic.

There would be no escape from the consequences of significance though the builder himself might be unsure or unaware of what he was doing and, as the art of building is now in our nation, be merely executing a taste or trend without being aware of the nature of his act. On this basis the collectivism preached at certain of our colleges at present must be seen as the ideal collectivism of communism. The UN opus as a fascist countenance. Fascism and communism are at the poles of world dominion. Where then is the countenance of democracy? That inward vision of the relation and truth of things—an eye quick to note and distinguish, sensitive to design and to over-all harmony?

No formal or quantitative method whatever is useful for the spread of democracy. Democracy cannot standardize, proselytize and convert. It can be no missionary without betraying the principles of its very life.

Left-wing modern-architecture now tends to betray democracy. Leading knowledge-factories in our nation inculcate collectivist doctrine in our young architects. In respect to any national value the great art of building might render our people in their tardy struggle for a culture of their own, these universities spread the communist doctrine so completely that the 'witch-hunt' by FBI in the State Department for victims is ridiculous. A young builder remarked to one such professor that 'the work of all his students looked like his, nor could anyone tell the work of one student from that of another'. The professor

replied, 'That is just what I want'. So it is that communism spreads into architecture by collectivist exponents and shepherds.

Quantity vanquishes quality. If doctors can thus indoctrinate the builders of a free democracy with what cannot be said in our midst, is this emasculation of the individual less harmful because higher up?

The weakness of the collectivist philosophy of communism lies in the quantitative denial of the virtues of the qualities of individuality. No one denies the virtues of 'team-work' (or of 'the committee') in proper place. But is this proper place conception? Are Shakespeare's, Blake's, Wordsworth's, Goethe's, Dante's, Emerson's, Whitman's, Thoreau's, Melville's equivalents in the Art of Architecture to be rewritten Soviet-wise according to exponents of modern architecture safely sitting in the arm-chairs of universities? Not yet.

In any struggle for indigenous culture (what other culture is there?), no matter how gentle and tactful they may be imports are always hazardous. I suggest that we, in these United States at least, continue, with honest arrogance, to *grow our own*.

MORAL: No scientist should be allowed to teach ART.

L'ENVOI: Taint of the 'Classic' Palladian or any Greco-Roman in our architecture has been pretty well purged from our 'Modern'. But now it seems the spirit of democracy (our organic-architecture)—true basis of the 'modern'—must be defended. Inspiration by the directness of vision of the free mind must be recovered in our midst by our young architects if our native culture is to be lifted to the high level (beyond ancient culture) to which organic-architecture has aspired.

J. M. Richards

Here we see the Master, as always, deeply concerned with fundamental issues. But the picture he paints of present tendencies in American architecture, which he finds so disquieting, would surely be more distinct without his sweeping distribution of epithets: communist, fascist, collectivist, democratic and the rest?

Labels have their uses, and Mr. Wright has effectively employed his favourite epithet 'organic' to define the values on which his own architectural philosophy is founded. But we know what 'organic' means because it is an architectural concept, which can be illustrated in terms of building. The others are not; in fact, they pose more questions than they solve. For example, is it really correct to equate collectivism with communism in the architectural sphere and to suggest that to promote a standardized internationalism is to 'rewrite Soviet-wise' the art of architecture. Present practice in the USSR and its satellites (see the REVIEW for March) suggests just the reverse. The present Soviet insistence on 'popular' forms of external appearance, though by no means 'organic' in Mr. Wright's sense, is rabidly national. It shows a consciousness of the same need that Mr. Wright insists upon when he writes of people's 'tardy struggle for a culture of their own'. The struggle may, in our view, be taking the architects of the communist countries in an utterly wrong direction, yet they would certainly claim that in their own way they are doing what Mr. Wright would have everyone do: helping the people towards architectural feeling of their own, rather than imposing the tastes of others on them.

No, architecture as practised in communist countries is not the enemy Mr. Wright is gunning for, because his special enemy is the intellectual with his preconceived ideas, and the communists distrust the intellectual approach as much as he does. His enemies seem to be the teaching of the academies and the international style. In attacking the

academies as the home of the intellectual, Mr. Wright weakens his case by suggesting that all the, as he styles them, 'knowledge-factories' aim at absolute standardization. Nevertheless, his complaint cannot be dismissed as part and parcel of his intense individualism. His is the natural mistrust of the man of feeling for the intellectual, and architecture needs the man of feeling as much as ever in the past. Our knowledge that acceptance of the modern technical revolution can be combined with genuine feeling we owe largely to Mr. Wright, and his own example justifies his contempt for the arm-chair pedagogue.

Yet the modern age, like any other, needs to agree about architectural principles—to create a canon of its own even while it gives leave to its best architects to depart from it. It therefore needs academies of a kind. All revolutions create their own canon while they are destroying the old one, and the role of the schools is to nourish the canon, and initiate the novice into it. In due course he may choose to depart from it, but if it happens that he is not of the temperament to do so, he has the canon on which to fall back, and this leads to a second point which Mr. Wright ignores. Few men are innovators, and, while it is vital not to inhibit those who are, it is equally vital to provide the others with a standard by which they can be guided; hence the need for a canon, for a contemporary vernacular, even for clichés. In fact, two antithetic movements are needed at one and the same time: an international standardizing movement, and a reaction therefrom in a strongly differentiative, individualistic direction. If we had to choose between the two we would take Mr. Wright's side and choose the second, but it is possible as well as desirable to choose both, and while Mr. Wright performs a service in stressing the need for the second, he performs a disservice by pouring scorn on the first.

Quantity indeed, as Mr. Wright says, can vanquish quality, but this does not mean that quality is only possible in works of architecture into which the element of quantity—whether it consists in the use of factory-produced components or the co-operation of a group of designers—does not enter. Otherwise we are driven back to the handicraft age. And similarly we must indeed, as Mr. Wright again says, grow our own culture, and there are signs that we are now beginning to do so; that modern architecture's international phase is already passing. This phase was, of course, part of the necessary process, already referred to, of establishing a canon—of finding common ground—a process which has included the spread of Mr. Wright's own influence in Europe, notably on Gropius and Mies van der Rohe, the absorption of these and other architects into the United States, and the subsequent creation of something specifically American (for example, the work of Skidmore, Owings and Merrill) out of what they brought with them. Any new regional culture must be nourished on contemporary needs and disciplines; on—to borrow one of Mr. Wright's own phrases—the nature of our own materials, not on rejection of all that one country has in common with others; and to have increasingly much in common is inevitable in the contemporary world. The process of growing our own culture is to accept what is general to everyone and evolve from it what is particular to us.

Mr. Wright understands all this, and his cry of despair is not an admission that good architecture cannot come out of the conditions imposed by the contemporary world. But others might take it as a plea to return to the primitive, the handicraft and the unsophisticated. That is why, in welcoming Mr. Wright's outspoken opinions, one must add that they should be taken as a challenge. We can best answer him by showing the world what a considerable contribution international science, and team-work and even academic teaching, can make to the creation of *individuality* in architecture.

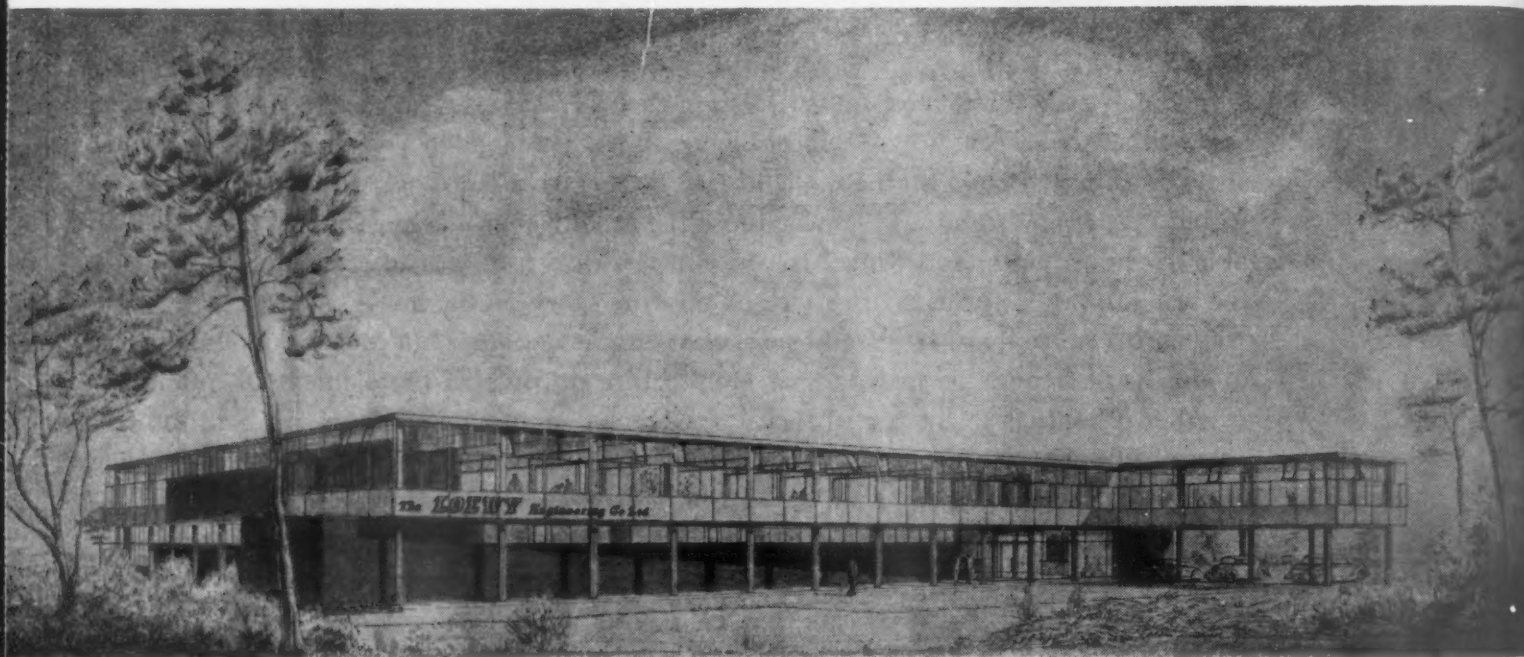
PREVIEW

1

OFFICES

AT POOLE, DORSET

FARMER AND DARK: ARCHITECTS



Only a very few commercial or industrial buildings in England since the war have been comparable in technical or architectural quality with the most advanced works in other fields, such as schools, but the small group of first-rate designs has now been augmented by these offices at Poole, Dorset, designed by Messrs. Farmer and Dark. Though the frame is of pre-cast concrete units made on the site, nearly all the internal partitions and external cladding will be of dry-erected factory-produced units, in which the clients have a particular interest,

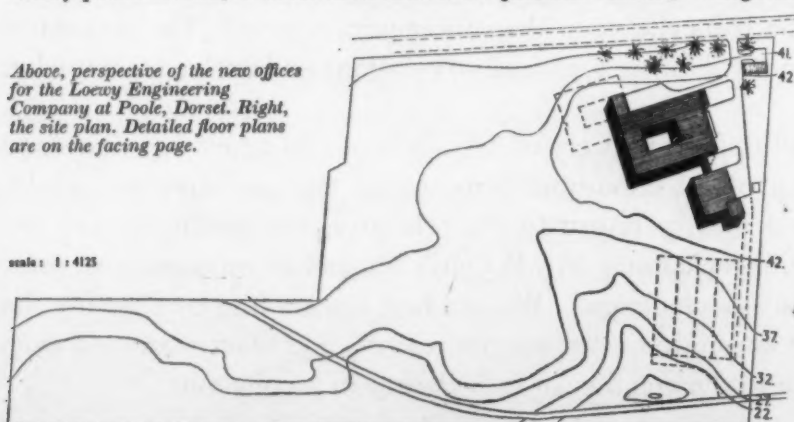
since they are engaged in the design and development of presses and rolling mills used, among other things, in the production of hardboards and aluminium extrusions.

Basically, the plan is a rectangle with a hollow centre, but this is diversified on the ground floor by access requirements and storage and canteen facilities, and the simple rectangle only becomes fully apparent on the upper floor which is given over almost entirely to design and drawing offices, excellently day-lit from the large windows

which occupy most of the outer and courtyard walls. The plans also show how little of the interior walling is of massive materials. Brick walls encase only certain fixed elements of the layout, and other partitions are of hardboard panels which may be demounted and re-erected—a process which is facilitated by the use of flush ceilings, and a standard module, 40 inches horizontally, 8 feet vertically, throughout those parts of the building where adaptable planning is required. Construction has just been put in hand, and provision has been made for a possible extension in the shape of experimental work-shops, as well as increased office space, on the same site.

Above, perspective of the new offices for the Loewy Engineering Company at Poole, Dorset. Right, the site plan. Detailed floor plans are on the facing page.

scale: 1:4125



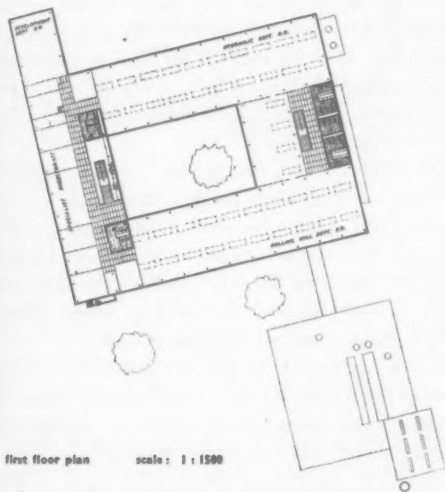
2 COLLEGES OF FURTHER EDUCATION IN LANCASHIRE

G. NOEL HILL : COUNTY ARCHITECT

**G. S. Pester, J. Nicholls, C. A. Spivey, A. Whitehead,
G. L. O. Rossant, J. A. Forbes, P. T. Rennison
and A. Wilson : Assistant Architects**

Few bodies have done more, collectively, to take the stigma from the term 'municipal,' as applied to architecture, than Education Committees. To the examples of enlightened patronage of contemporary design shown by such local authorities as Hertfordshire and the LCC, there can now be added the group of Colleges of Further Education which has been initiated by the Lancashire County Council, and designed by the County Architects' Office, under the direction of G. Noel Hill.

Colleges are projected for Accrington, Ashton-under-Lyne, Lancaster-and-Morecambe, Nelson and Salford, and will have certain economic and planning features in common. Thus the complete project for any one college has been broken down into functionally separate instalments, each costing about £100,000 to erect, to be built as and when economic circumstances permit, beginning in every case with work-



first floor plan scale: 1:1500

ASHTON-UNDER-LYNE



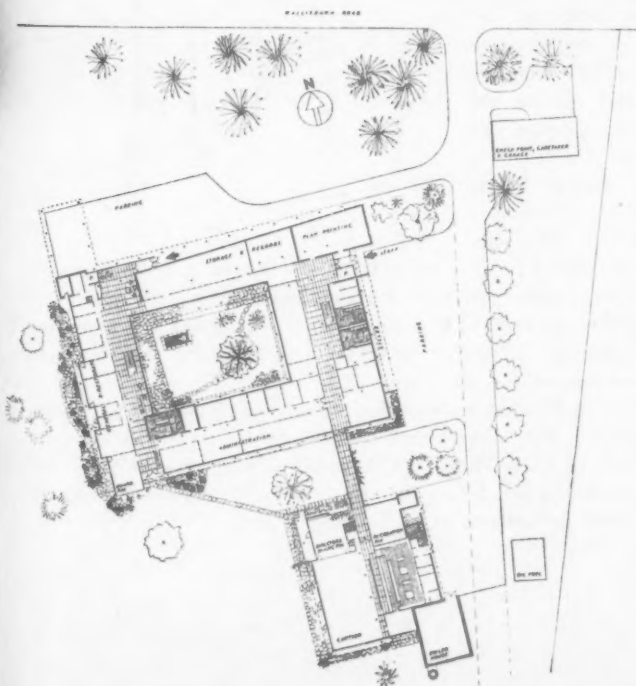
shops and laboratories, followed by class-room blocks, and lastly gymnasias and social facilities. These last are intended for use by the public at large and have been arranged so that such use and access does not interfere with the normal working of the college.

The most advanced of these projects in terms of construction work



ASHTON-UNDER-LYNE

accomplished is that at Ashton-under-Lyne where site work began in February, 1951, and the workshops and heavy laboratories are now nearly complete, although work was delayed by the necessity of piling



ground floor plan

scale: 1:1500

LANCASTER AND
MORECAMBE



the foundations. Subsequent instalments will include a six-storey teaching block, a group comprising lecture and assembly-halls, canteen facilities, and lastly gymnasia. The college will ultimately serve some five hundred students in textiles, light engineering and building, and will occupy an eight-acre site.

Also put in hand in February, 1951, were the colleges serving Accrington and Lancaster-and-Morecambe. In both cases the first instalment completed will be a shell-vaulted structure housing workshops, with laboratories, etc., to follow. About eight hundred students will be housed in the Lancaster-and-Morecambe scheme, but the ultimate size and layout of Accrington has not yet been settled, and accommodation for about four hundred is provisionally envisaged.

NELSON



Work at Nelson has begun only in 1953, but this represents the most advanced and fully thought-out design so far, in spite of a difficult site which is liable to floods and necessitates raising the ground floor about three feet. The workshop block, now under construction, is of steel with asbestos cladding, but the central section, which will house laboratories, is of concrete portal frame structure. The college is expected to serve eight hundred students in textiles and engineering.

The project for Salford is, in fact, an extension to the Royal Technical College there, and work will commence in 1954.



NELSON

3 HOUSE AT DAR-ES-SALAAM

ERNST MAY: ARCHITECT

The Aga Khan's new house on the Tanganyika coast, which has been designed by Dr. Ernst May and Partners, must be one of the very few princely residences to be projected since the early twenties, and is probably unique among them in the employment of a contemporary architectural idiom. Its situation in the tropics, facing the ocean on the eastern side of a continental land mass, has inevitably called forth a planning solution comparable to those evolved for similar conditions in Brazil, but conditions in Dar-es-Salaam, within seven degrees of the equator, are even more extreme, and some details of weather protection require a very wide range of adjustability.

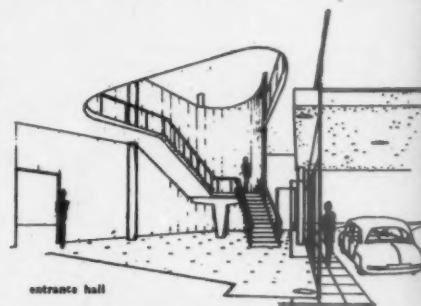
Dominating a cliff facing the Indian Ocean, the building was laid out so that it would catch the prevailing breezes, which blow from north-east and south-east, yet in certain seasons the rooms facing the seafront must be sealed off completely against the impact of heavy gales. This is achieved by surrounding the social hall on the first floor with walls consisting of vertically pivoted fins and by using sliding-folding glazed doors in the living room on the ground floor.

The Aga Khan's and the Begum Khan's private suites are accommodated on the first floor of the north wing of the residence. A verandah runs along the full length of this section of the building. Light grilles have been used to break the force of heavy storms and will also secure privacy for the suites behind. The service wing, which stretches to the west of the building, adjoins the dining room which has been laid out at the south-east corner of the main block.

The garden layout makes use of the topography of the site.

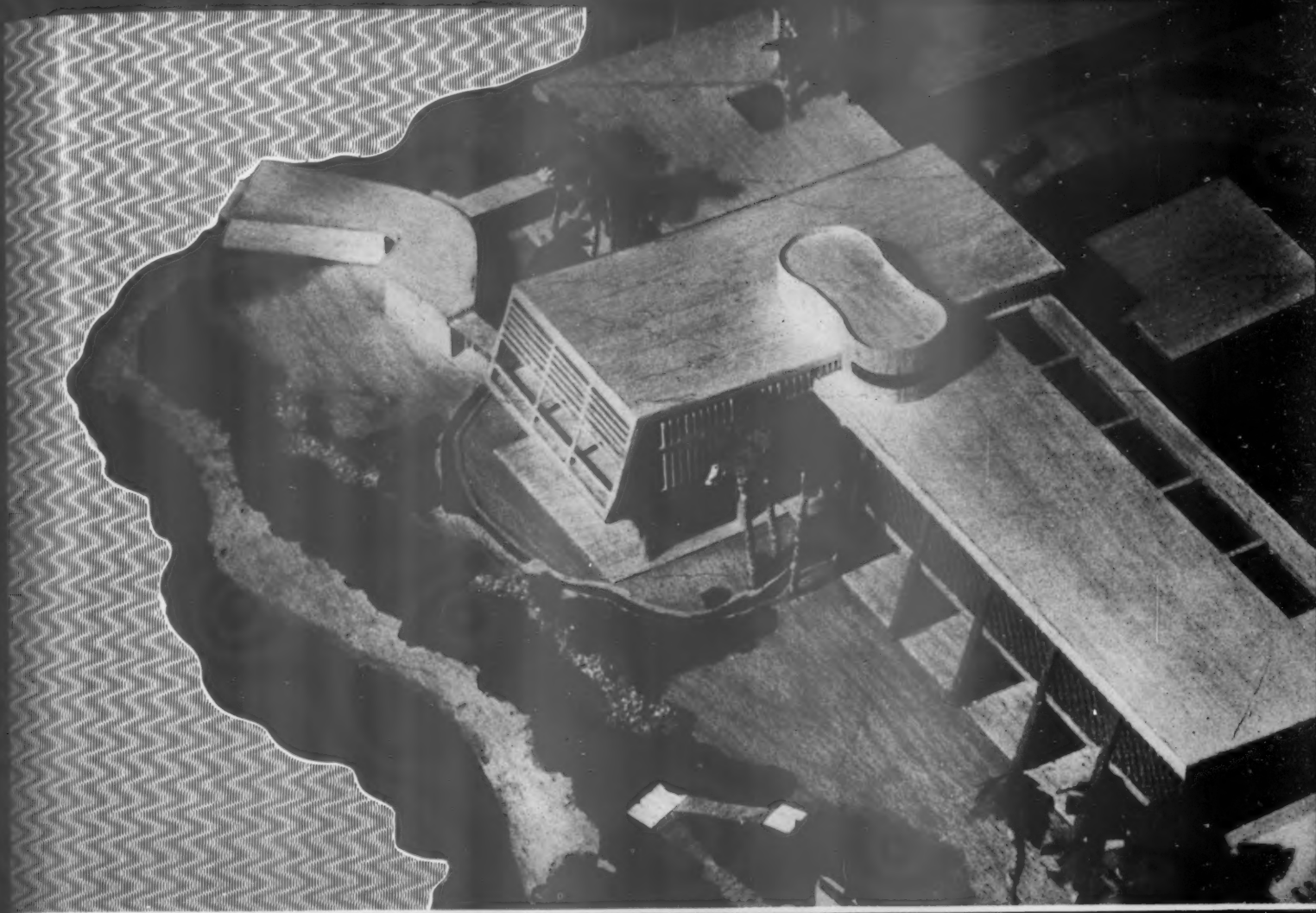
Existing terraces in the coral cliff have been used to accommodate a sheltered swimming pool with changing cabins and a tea terrace overlooking the bay north of Dar-es-Salaam. Smoking and play rooms jut out beyond the cliff with a cantilevered verandah enjoying the same beautiful view of the ocean.

A sweet water channel, widening at both ends into pools, surrounds the reception and living rooms. It terminates in a patio between the main body of the residence and the bedroom wing. A palm grove has been planned along the service wing and small individual groups of palms flank the seafront of the building.

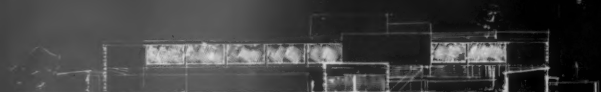
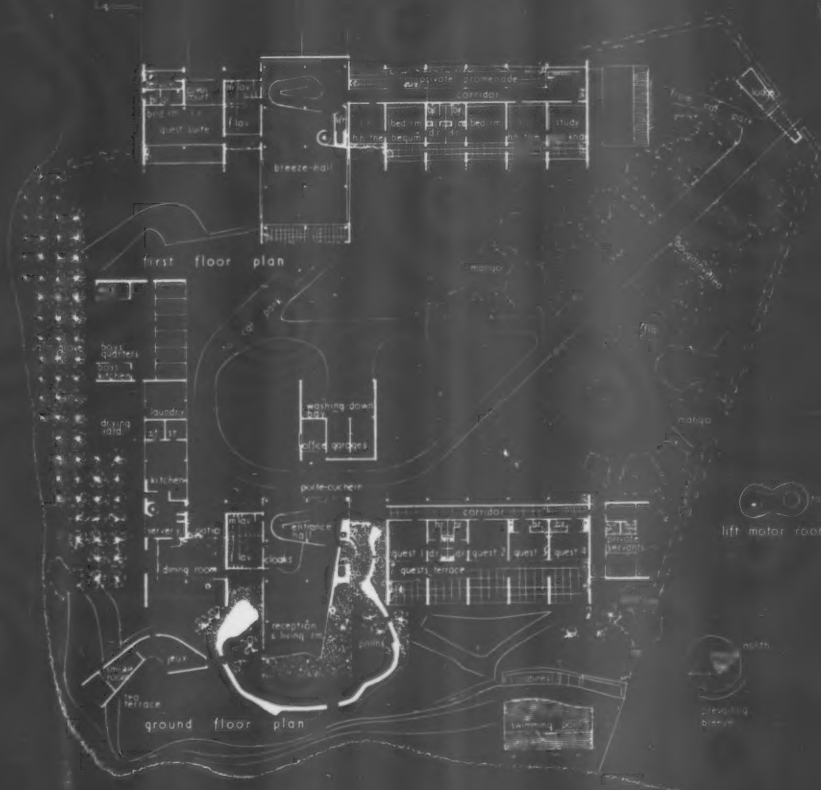


entrance hall

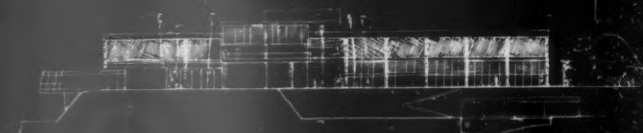
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HOUSE FOR H.H. THE AGA KHAN AT DAR ES SALAAM



entrance elevation

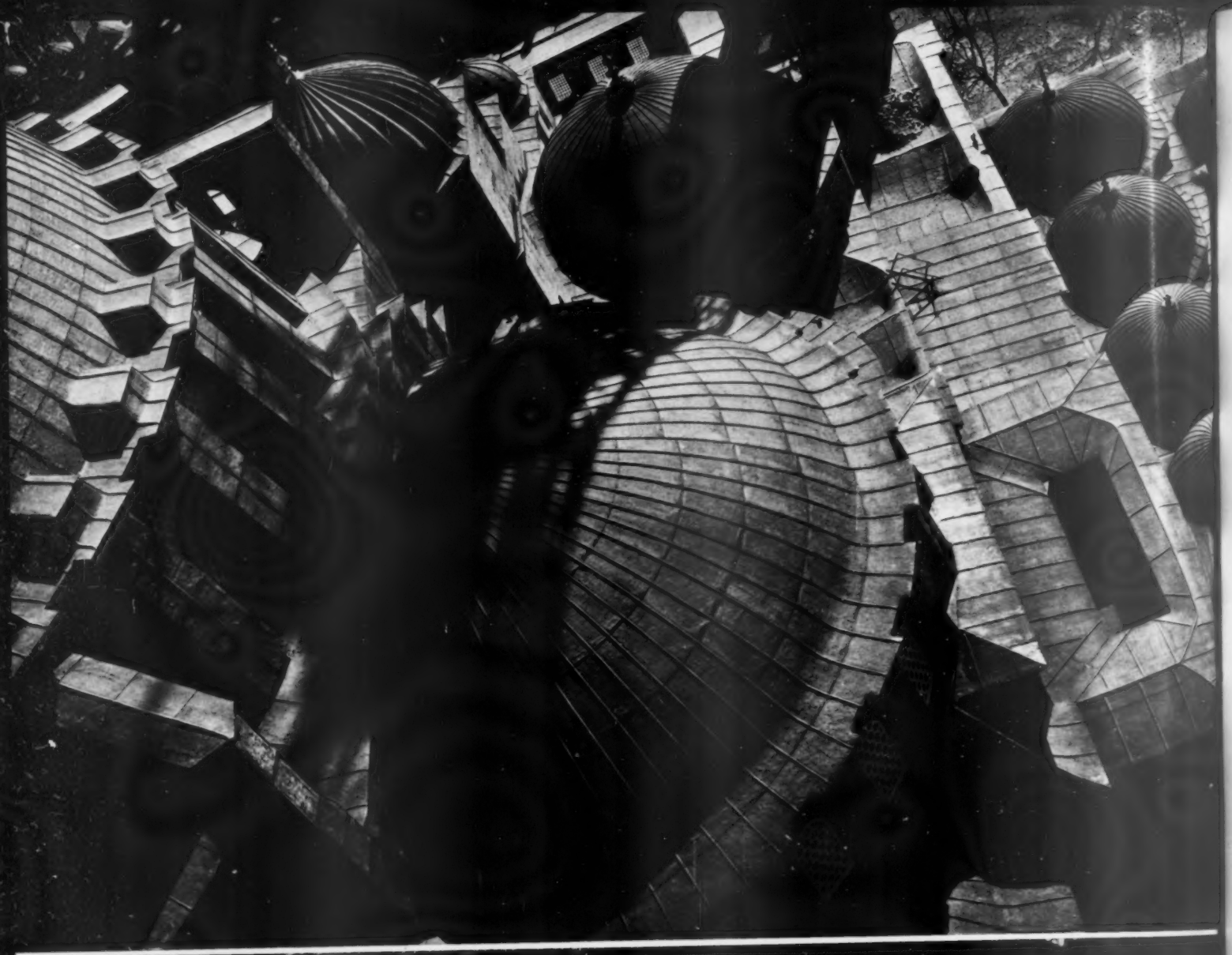



ocean elevation



section a-b

10 20 30 40 50 60 70 80 90 100
FEET



With its boldly sculptured domes and soaring interior, shown on the opposite page, the Suleimanieh in Istanbul  is one of the masterpieces of Mirmar Sinan. As well known in his own country as are Michelangelo (whose near-contemporary he was) or Wren (whom he resembled in his status and practical approach) in theirs, Sinan is hardly known or appreciated outside Turkey—a deficiency which Mr. Corbett sets out to remedy in the article below.

Spencer Corbett

SINAN

ARCHITECT IN CHIEF TO SULEIMAN THE MAGNIFICENT

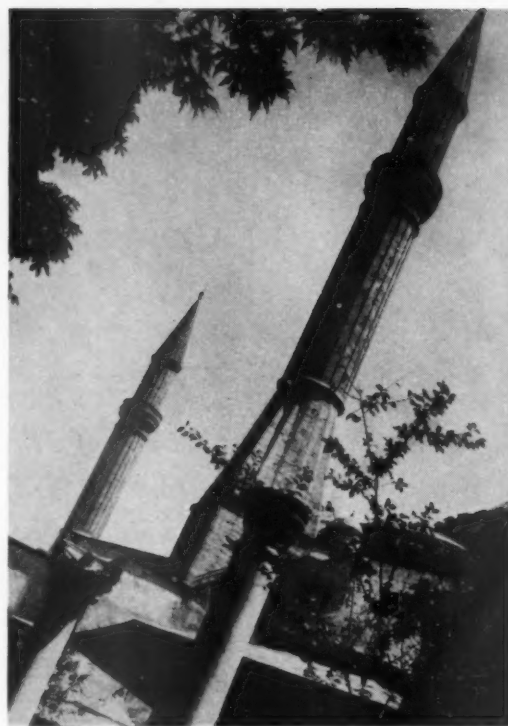
Not very much is known of Sinan's personal history. The biography by Mustafa Sa'i which appeared in Stamboul soon after the great architect's death in 1578 records that Sinan was born at Kayseri in Cappadocia in 1489. His parents were not Turkish, though whether they were Armenians, Greeks or some other nationality is a subject which has been discussed at considerable length and not without prejudice by members of the various races concerned. Sinan joined the Janissaries and distinguished himself in the field of military engineering on the European and Persian fronts between 1520 and 1535. His ability in bridging operations was especially praised. These successes seem to have led to his being employed as the sultan's architect, and the skill which he had learned on the battlefield was now turned to account in the design of palaces and mosques. Suleiman I, Kanuni, The Lawgiver, The Magnificent, occupied the Ottoman throne from 1520 to 1566 when the power of the Turkish Empire was at its zenith. Like most great monarchs he delighted in magnificent buildings. Sinan's perception as an artist developed more slowly than his engineering ability; but the Sultan supplied the impetus for the work as well as the funds, and Sinan had to do little more than organize a large *atelier* of

apprentices. He was probably overworked, and he was trying to learn an art at the same time as practise it; so we need not be surprised if some of his early buildings lack imagination. His first important work was the Mosque of Roxolane in Stamboul, which was started in 1539. He died in 1578, and his biographer records that in the intervening period Sinan designed and built one hundred and thirty-one mosques, nineteen tombs, sixty-two schools, thirty-three palaces, an equal number of Turkish baths, and fifty-six other buildings, including hospitals, aqueducts and bridges; a total of three hundred and thirty-four buildings. The fame of this fecundity encouraged another Turkish writer, Evliya Chelebi, to proclaim Sinan the author of three thousand and sixty buildings. This exaggeration is intentionally absurd, but it suggests one explanation for Sinan's great fame in Turkey; for the relative values of quantity and quality are differently assessed in different places at different periods. Perhaps the large number of buildings for which Sinan was responsible gave him a reputation which might be withheld to-day from architects who have signed their name to even greater numbers of plans.

But it would be utterly unfair to leave the impression that Sinan was no more than a good organizer

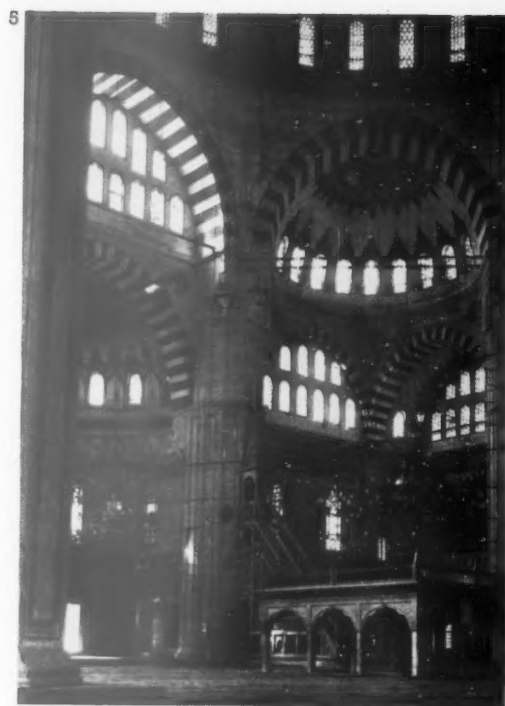
and a skilful engineer. Some of his early works may have little more to commend them than the stability which an experienced military engineer was able to impart, coupled with the splendour supplied by the Imperial purse; but his later works display infinitely more important virtues. The Mosque of Selim II at Edirne (Adrianople) is a superb creation, 4. Seen from a mile or two away, as it stands upon a slight hill and soars up like an explosion over the placid, meadowy landscape of the level Martiza valley, it is a really thrilling work of architecture and need not be ashamed by comparison with any contemporary Italian work. On nearer approach it is as good. The exquisitely balanced alternation between the convex mass of the structure and the concavity of the arcaded court which lies in front of it, 7, is masterly. The interior is spectacular, 5; a gigantic dome supported on eight massive piers; their sturdiness strongly contrasting with the delicate patterns of the glazed tiling, and the sumptuous niggling detail of the walnut, bronze, nacre and ivory doors.

This magnificent dome is the climax of all Sinan's work, for all his mosques are variations on the same theme; the covering-over with a great ciborium-like roof of the space of ground which is reserved for Moslem prayer. That is the simple problem which the Turkish mosque architect has to solve. It is totally different from the problem which confronts Christian architects in their church-designing. Guide-books are never tired of pointing out resemblances between early Constantinopolitan mosques and the Church of Aghia Sophia which Justinian's architects finished nearly a thousand years before the Turks came to Constantinople. They suggest that all subsequent mosques in the city were deliberate imitations of the church. Of course this is nonsense; the Turks were fully aware of the church's characteristics long before 1453; indeed, the Greeks had employed Turkish architects to repair the building, and if they had wanted to copy it there were ample opportunities for them to do so while the Turkish capitals were at Brusa and Adrianople; yet they did not. In fact, in everything except a special method of vaulting, the mosques of Constantinople are directly and obviously descended from their own ancestors, and there is no need to look for prototypes in Christian architecture. The idea of a connection probably grew up in the guide-book writers' nebulous imaginations in consequence of two superficial points of resemblance. Firstly, four Turkish minarets (two of them by Sinan), 3, have been added to Aghia Sophia, and they naturally give the building a mosque-like appearance. The second point of resemblance is more serious. Aghia Sophia has a particularly satisfying bubble-like silhouette due to the system of vaulting which Justinian's architects employed. Half-domes are used not only to extend the area covered by the main dome, but also simultaneously to contain its outward thrusts. This brilliant scheme was never repeated on a large scale in Christian architecture, because the declining Byzantine Empire had not the resources to do so. For nine centuries the huge vault stood there sterile, a symbol of the great unretrievable past, like the Colosseum or the Pyramids. But the new life which its Turkish conquerors brought to the city revived the old idea, and



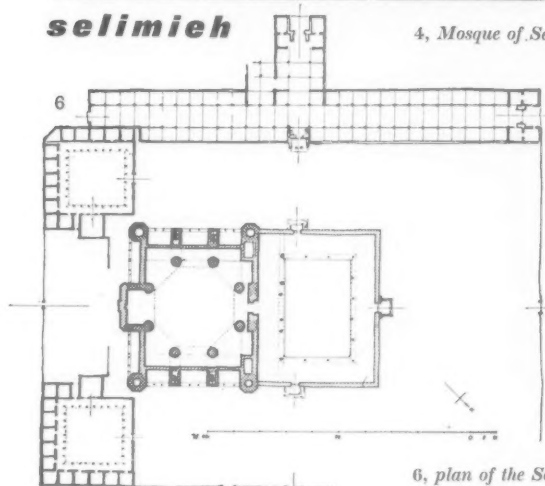
Two of the minarets added by Sinan to the basilica of Aghia Sophia.

the first important mosque which they built (variously called The Mosque of Mahomet II, Mehmetieh or Fatih) was roofed in a similar manner. It may be that Mahomet II liked the great open area of floor in Aghia Sophia, found it well suited for Moslem use when the church had been turned into a mosque, and ordered Christodoulos, his Greek architect, to provide similar advantages in the mosque which he was building to celebrate the victory of Islam. The expanding Ottoman Empire could afford a luxury which had been denied to the dwindling Byzantine fortunes. But, apart from their buttressing half-domes, the church and the mosque have almost nothing in common. In almost everything else Aghia Sophia is a straightforward Christian Basilica, with its parallel colonnades, the galleries which they support, and the aisles behind them. The architects' primary conception was a long avenue of columns with a sanctuary at one end and an entrance at the other. The mosque is entirely different; there is no nave, no sanctuary, as far as possible no axis. We have already noted that the underlying idea of a mosque is a ciborium, radially planned, covering an area of ground no part of which is more sacred or more important than another. There is no leading-on from the lesser to the greater, no procession, no climax. The idea of an avenue is alien to Turkish mosque design. Nevertheless, there are two parts to the Moslem rite, ablution followed by prayer, and since they succeed one another it is hard to suppress all idea of procession. Each prayer-hall is preceded by an open court where an ablution fountain is the central feature. However, the axuality which is thus inevitably introduced is minimized by a strong transverse feature, the portico, which invariably runs along the façade of the prayer-hall. Another example of this retreat from axuality is seen in the interior of most



selimieh

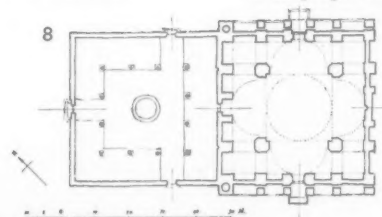
4, Mosque of Selim II; 5, dome interior showing three of the massive supporting piers.



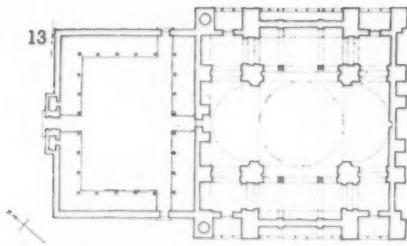
6, plan of the Selimieh; 7, part of the arcaded fountain court in front of it (Edirne).

shah-zadeh

8, plan of Shah-Zadeh, the Mosque of the Princes; 9, interior of the dome; 10, entrance to the prayer hall from the fountain court (Istanbul).



11

**suleimanieh**

12



11, the mosque named after Suleiman the Magnificent; 12, courtyard portico; 13, plan.

14



15



16



14 and 16, the interior of the Suleimanieh; 15, the interior of the Aghia Sophia. The nave of the latter is closed by screen-like colonnades compared with the open arcades of the Suleimanieh.

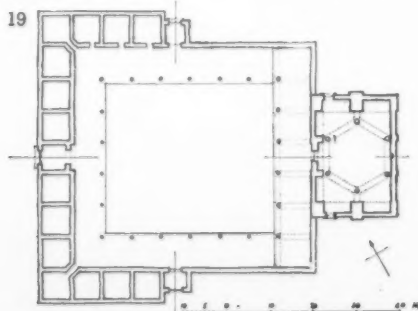
ahmed pasha

17



17, the entrance to the prayer hall; 18, the interior. The plan, 19, shows the unusually large fountain court compared with the prayer hall (Istanbul).

19



18



mosques. As in churches, galleries are needed for the accommodation of the women of the congregation; but the Moslem architect avoids the basilican plan, where the galleries and their supporting colonnades line the central nave. The galleries in the mosques have very little to do with the architecture; they are installed rather as though they were separate pieces of furniture. Although built of stone and often integral with the rest of the masonry, they are usually on a smaller scale than the main part of the structure, and their colonnades are sometimes deliberately placed so as to be out of correspondence with the main features of the building.

We shall return to the comparison of mosques and churches when we discuss the Mosque of Suleiman, but we must first deal with an earlier work of Sinan's which has some interesting characteristics. The Shah-Zadeh or Mosque of The Princes was built while Sinan's military successes were still fresh about him, and its rigidly correct plan, 8, is precisely what one would expect from the hand of a soldier. It is designed like a fortress or a gun emplacement and seems to reflect all the ruthless logic of an army handbook. The plan is a square figure about forty-five metres each way, subdivided into sixteen equal squares. The dome occupies the four middle squares and the lines dividing the twelve perimeter squares mark the positions of the piers and buttresses. The dome with four buttressing half-domes which Christodoulos had built for Mahomet II in the previous century was repeated in the Shah-Zadeh. The expedient of building the screen walls in various positions relative to the structural piers between which they stand, saves Sinan's soldierly methods of planning from utter dullness. Thus, the south-east walls are placed as near as possible to the interior of the building, while on the other three sides they are pushed back towards the exterior. However, it must still be admitted that the interior of the mosque is not a success. The four massive piers dominate the scene without being impressive, like four bores at a party, and nothing else has sufficient vitality to retrieve the situation, 9. The fountain court outside is pleasant, with an atmosphere which is both spacious and intimate, 10. Sinan has extracted full value from the contrast between the hollow darkness of the arcades and the bulbous lightness of the domes behind. The icing-sugar decoration of the minarets is an experiment which Sinan did not repeat. The mosque was finished in 1548 and was dedicated to the memory of the Sultan's children.

All through the 'forties, 'fifties and 'sixties of the sixteenth century Sinan and his apprentices kept their patrons supplied with designs for mosques, palaces and every other kind of building, all over the Ottoman Empire from Bosnia to Mecca. His influence extended even to India, for Akbar's palaces in Lahore, Delhi and Agra were designed by one of his pupils. A list of his works, compiled from Sinan's own testament and from the statements of Mustafa Sa'i may be found in the *Encyclopaedia of Islam*. Buildings are reported in Damascus, Ankara, Sarajevo and Mecca, but much the greater part of his work was in Stamboul and its immediate neighbourhood.

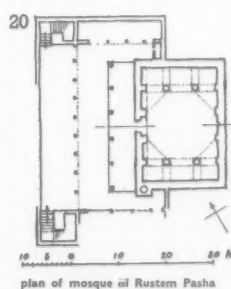
The most splendid of Sinan's buildings in the capital is the Suleimanieh, the great mosque which was

named after Suleiman the Magnificent, and which was finished in 1566, the year of the Sultan's death, 1 and 11. It is an enlarged version of the Shah-Zadeh: dome and buttresses being identically arranged in a grid of sixteen equal squares; but the faults of the earlier building are recognized and remedied. Inside, the vault is considerably enlivened by the substitution of windowed tympana for two of the half-domes, 2; the tympana resting on arcades which are made up of large central arches flanked by smaller ones, 14. By the omission of two half-domes and the introduction of side arcades, the plan of the Suleimanieh, 13, may give the impression that it imitates the design of Aghia Sophia; but a comparison of the two interiors shows that nothing could be further from the truth, 15 and 16. The nave of Aghia Sophia is *closed* on either side by a screen-like arrangement of colonnades, whereas the central hall of the Suleimanieh *opens* through spacious arcades into the adjoining galleries. The difference between the two designs is the difference between solid and void. Sinan takes advantage of his arcades to introduce exciting perspective compositions of arches disappearing behind arches, a device which leads the eye outwards towards the perimeter of the hall. At Aghia Sophia the colonnades are designed to reflect and concentrate the attention on the axis of the church.

The serene dignity of the portico in the courtyard of the Suleimanieh shows that Sinan was already achieving mastery of the art of architecture, 12. These seven arches, elegantly poised on antique column shafts are one of the most satisfying sights in Stamboul.

The Mosque of Ahmet Pasha at Top Kapu in Stamboul was built in 1555, 17. It stands in a quiet part of the town and its suburban situation is pleasantly characterized by the unusually large, tree-grown fountain court through which the small prayer-hall is approached, 17 and 18. Sinan tried to introduce as much variety as he could into his work and did his best to base the plan of each mosque on a different

geometrical figure. At the Shah-Zadeh and Suleimanieh we found subdivided squares; at Ahmet Pasha, 19, the dome has a hexagonal base with six pendentives rising from six free-standing columns. The Mosque of Rustem Pasha, by way of a change, has an octagonal plan, 20, and while the prayer-hall is about the same size as that at Ahmet Pasha, the



courtyard has less than a quarter of the area. This exiguity reflects the character of the district in which the Rustem Pasha mosque is built, for it stands in the busiest and most crowded part of the city, close to the harbour and the bridge which crosses the Golden Horn to Galata. It is quite difficult to find the place, and all but impossible to obtain a view of its exterior. Unostentatious doorways open from the narrow street into dark stone staircases which, winding steeply upwards, emerge in the angles of the closely-knit fountain court. Theatrical arrangements like this are typical of Sinan's taste, and, indeed, strong contrast is meat and drink to most Turkish architects—witness

the violent effects which are achieved by the juxtaposition of needle-like minarets and bubble-like domes. The dazzling faïence interior of the Rustem Pasha mosque is another instance of the same expedient; its brilliance and delicacy being a striking antithesis to the dark and squalid alleys, pulsating with every kind of commerce, through which the mosque has to be approached.

Sinan would have been no friend to those anæmic souls who hold that beauty and truth are inseparable. To him all means, however deceitful, are justified by a successful design. In the Mosque of the Princess Mihr-i-mah near the Edirne Gate in Stamboul, we find a rare specimen of successful artistic dishonesty. The exterior of the mosque has a pleasing arrangement of a dome rising above a square building on four pendentives which are skilfully indicated by the contrast between great blank spandrels and lavishly fenestrated tympana, 21. The outward thrusts of the pendentives are resolved, and the unity of the design is handsomely emphasized by four massive polygonal turrets, one at each corner of the square building. Now look at the plan, 23. Two of the fine thrust-containing turrets never reach the ground at all. Inside, 22, Sinan seems to have tired of his squares, hexagons and octagons, and seeking variety balances his dome happily, if unethically, between two parallel colonnades. At least, that is the impression received, though in fact the columns do not support anything but the tympana. Their shafts are magnificent antique granite affairs of immense strength and solidity. Perhaps it is a little sad to find them thus misused, but ethics are out of fashion and if this little note of melancholy is perceptible, it only adds sauce to Sinan's carefree sophistry. The Mosque of Princess Mihr-i-mah was finished in 1556.

It is not unusual for an aged artist to imagine that the works of his dotage are his greatest triumphs when in reality he has left his zenith far behind him. Sinan was exceptional, he went on from strength to strength and was quite right in thinking that his latest works were his best. The Mosque of Sokollu Mehmet Pasha at Kum Kapu close to the Byzantine hippodrome, is dated 1571, when Sinan was over eighty. It may have been designed ten years before that, but it must still be one of his latest works, and it is difficult to imagine that he could have done anything better. Advantage has been taken of a steeply sloping site to arrange an unusually tall prayer-hall and a delicately proportioned fountain court at the top of a romantic tunnel-like stair, 24 and 26. Domestic buildings enclose three sides of the court and, at the point where the stairs emerge, the quiet rhythm of their oggee arcades is interrupted by a slightly grander pavilion, 28. Directly opposite stands the portico of the prayer-hall, 25, whose finer masonry and richer decorations are set off against the simple domesticity

of the other sides of the court. The inside of the hall is superb, 27. Its white stone walls and restrained ceramic decorations combine perfectly with the hexagonal plan and tall proportions in a masterly composition of graceful dignity. This mosque is listed in Mustafa Sa'i's catalogue as the *Mosque of Mehmet Pasha, Kadirga Limani*, and the remark in the *Lexikon der bildenden Kunstler* to the effect that the Mosque of Sokollu Mehmet Pasha is wrongly attributed to Sinan refers to another mosque of the same name at Asab Kapu in Galata. It must be supposed that this latter building is the work of one of Sinan's pupils or admirers, for in plan and elevation it is a miniature edition of Sinan's masterpiece, the Mosque of Selim II at Edirne.

Selim II succeeded Suleiman I in 1566 and reigned until 1574. The mosque which he built at Edirne was finished in the year of his death. It stands on the outskirts of the town on a level site at the end of a low ridge which is artificially enlarged by subterranean arcades along its south-west slope. An open space some 130 by 180 yards is thus made, in the centre of which stands the mosque, 6. As usual, it consists of a domed prayer-hall with an arcaded fountain court before it. The contrast between the convexity of the one and the concavity of the other is nicely adjusted, the traditional canopy over the ablution fountain being omitted so that the spaciousness of the court may be sufficient to balance the immense mass of the opposed prayer-hall. The portico along the front of the prayer-hall has wide and narrow alternating arcades reminiscent of the arcades used in the interior of the Suleimanieh at Stamboul.

The enormous dome rests upon eight polygonal piers whose value in the composition of the interior is subtly adjusted by lightly-worked panelling. Outside, the eight piers are marked by pinnacles encircling the dome, 4. The outward pressure of the vault is contained by eight buttresses, four concealed and four displayed. Two buttresses are hidden in the mass of masonry beside and above the main doorway and two are disguised in the side walls of the exedra within which the prayer-niche is placed. The other four buttresses in the Selimieh are heavily emphasized in the side elevations, their more than necessary mass being economically used for staircases which lead to the galleries. In the end elevations the apparent downward and outward thrust of the dome is sufficiently compensated by the prayer-niche exedra on the one hand and the mass of the portico on the other; but at the sides it is necessary to emphasize the buttresses as much as possible.

Sinan was eighty-five when the Selimieh was finished. He lived for four more years and died in 1578 at the ripe age of eighty-nine. He is buried close to the Suleimanieh in Stamboul, in a small tomb which he designed himself. Nearby are a fountain and a school which he endowed.

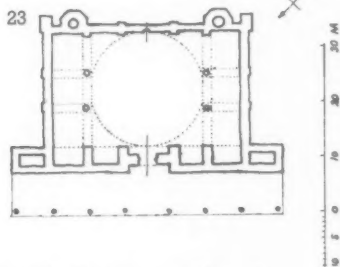


Mimar Sinan, 1489-1578.



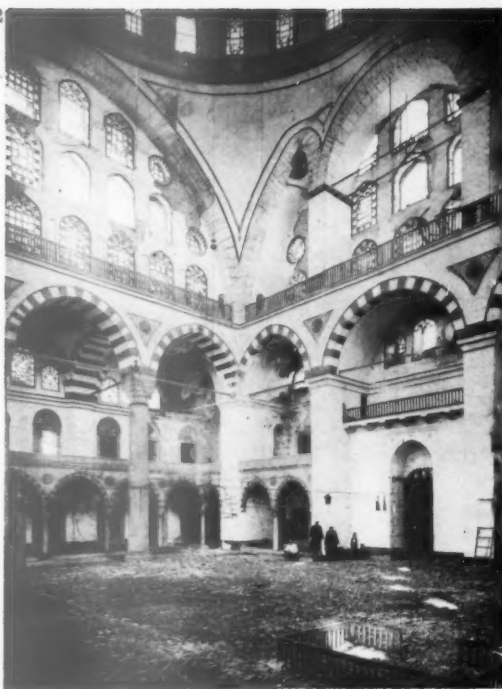
21

mihr-i-mah



21, exterior of the Mosque of the Princess, seen from the courtyard; 22, interior of the dome; 23, the plan, revealing that two of the four massive thrust-containing turrets do not reach the ground (Istanbul).

22

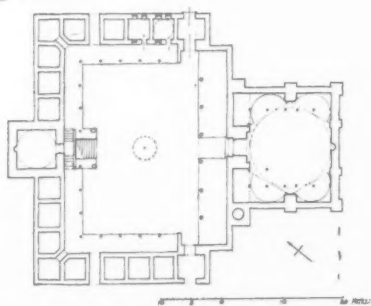
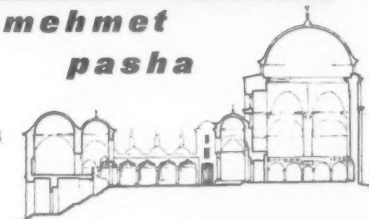


24



***sokollu mehmet
pasha***

26



The unusually tall prayer hall, 24, resulting from the rising site, 26; 25, detail of the prayer hall portico; 27, dome interior; 28, pavilion at head of courtyard stairs (Istanbul).

28




25



27





 Whatever memories of African sculpture, or of vernacular sun-breaking grilles, may have gone into the designing of this balustrade detail from Adisadel College Extension, its bold exploitation of the strong sunlight, by means of its white faces and terracotta edges, is typical of the inventive manner in which Fry, Drew and Partners, whose West African work is described below, have faced the challenge of tropical conditions.

E. Maxwell Fry

AFRICAN EXPERIMENT

BUILDING FOR AN EDUCATIONAL PROGRAMME IN THE GOLD COAST

The West African coast has lain for centuries outside the main currents of world development. A nearly unbroken line of surf, with few natural harbours, stretches from Dakar to the Cameroons, backed by swamps and a hinterland of high rain forest, petering gradually through all the stages of bush and scrub to the vast emptiness of the Sahara desert which is for its full length as marked a barrier and less negotiable than the ocean. Early contacts between Europe and West Africa for gold and ivory touched the coastal fringe at points, and the dark trade in slaves, the terribly profitable three-point trade between England, America and West Africa, did little to increase the penetration. It was the search for fats that brought traders into full contact with the regions lying behind the surf line, and it was in the two British colonies of Gold Coast and Nigeria that penetration broadened into a settled administration of territories which by the turn of the century were advancing towards co-operation for ends not then very clear, though not completely unforeseen.

The people of the rain forest lived tribally in groups which varied in size with the varying means of contact, of which the rivers were the most important, and many languages prevailed without a lingua franca. At the time of the British conquest of the Gold Coast the Ashanti had acquired an ascendancy over large parts of the country and remain to this day a spiritual force to be reckoned with, in competition nevertheless with other groups, the Fanti, Krobo, Ewe, etc., each with its tradition and its language. The Gold Coast prospered. Cocoa was introduced and succeeded as a small farmer crop. Thanks to Mary Kingsley as much as any one, the land was never alienated and there was established a basis for the recent advances towards self-government which since the last war have thrust West Africa into the currents of world politics.

Education came indirectly through contacts with traders and administrators—by no means negligible vehicles—and directly through Christian missions which followed the traders inland and at points preceded them. The Wesleyans, the Scottish Presbyterians and the English Church Mission, followed by the Catholic Mission and lesser organizations, established themselves in all the more populous parts of the country, setting up schools, some of which grew to considerable size on English public school lines, and fanning out into villages with African teachers giving a primary education inside mud walls and with scant equipment. This heroic but unplanned system of education came gradually within the orbit of political administration and in 1927, during the Governorship of Sir Gordon Guggisberg, the celebrated Achimota College was built to supply as wide and full an education as possible, a university in embryo, a training ground for African leaders. The value of mission

education is under-estimated outside the spheres of its direct influence. Yet it combines purpose with devotion and humility, has been pursued with determination under circumstances that would deter the foolhardy, and has offered what it had to give in faith. No wonder that in India it has outlasted the régime. And less wonder that in West Africa, where for so long it remained the only instrument for the purpose, it has been incorporated into schemes designed to secure an appropriate education for every member of the State.

The programme of school building launched immediately after the war by the Gold Coast government is part of a plan of mass education as complete and detailed as any being undertaken in the world, and thanks largely to the energy and foresight of two men, the late Mr. Thomas Barton, OBE, Director of Education and later Secretary to the Ministry of Education, and Sir Alan Burns, KCMG, the then Governor, its first phase is well on the way to completion. Large contributions from the Colonial Development and Welfare Fund voted by Parliament before the close of the war for such purposes made it possible to start without delay on the building of a ring of secondary schools and teacher training colleges under the aegis of established missions, with the object of providing as early as possible a supply of men and women teachers for the village schools, the building of which formed the second phase of the programme. This in essence was the original plan, now augmented by a rapid development of technical education and the establishment of a large university on a site near Achimota College, Accra.

The building industry of the country consisted in 1945 of three or four firms of European contractors working on established lines of unadventurous building and including architectural service with contracting as a matter of course. Such few works of magnitude as occurred from time to time were designed by European architects if they were beyond the capacity of the single Public Works Department architect, and buildings seldom exceeded the simple capacities of cement-block walling and pitched timber roofs. The announcement of large building programmes by Government and trade brought newcomers into the field with a flow of new capital into the industry, and to secure steady and satisfactory output the newly appointed architects to the scheme took the opportunity of basing the undertaking firmly on the RIBA form of contract, slightly modified to suit local conditions, with bills of quantities, complete architects' and engineers' drawings, and prompt payment to contractors on presentation of the architects' certificates. It speaks well for these old-established instruments of the profession that over six or seven years of steady improvement in the quality of the building covered by such contracts little or no cause for disagreement has arisen. The extent to which contractors shared with the Education Department and the architects the feelings of excitement and adventure generated by the scheme has also to be recorded; the Department were well served.

The greater part of the work has taken place within the forest belt or along the coast, with long transport hauls. Burnt bricks and tiles are barely used in a country with none other fuel than its precious forests. Good stone occurs infrequently; slate is unknown; timber is rapidly consumed by termites, and at the end of the war no seasoned stock remained. The only response to these conditions was reinforced concrete and cement-block walling with timber and asbestos-cement roofs, a system of construction that allowed of large openings through which the cooling breeze might pass. Starting modestly on this basis, the uses of reinforced concrete, thanks largely to the astonishing adaptability and skill of African workmen, have been considerably extended,* cast concrete has been freely used and the roof alone, despite the use of sheet and roll aluminium, remains a problem. The climate of the Gold Coast is humid, of which an exact reproduction may be experienced in the large palm house at Kew. No great temperatures, but humidity both day and night is constant, assuaged by the prevailing south-west breezes of the coast, and by the feebler airs of forest clearings. Cross ventilation is eagerly sought for and the effects of blanketing are readily appreciated. The best conditions are to be found on hilltops and generally planning must open out to allow breeze to penetrate. All schools in this first phase are residential, have assembly halls and sometimes chapels, a full range of science, art and special-subject classrooms, and staff housing on a generous scale.

* The first shell concrete roof in West Africa was recently completed at Ibadan University, Nigeria.

GOLD COAST

ARCHITECTS

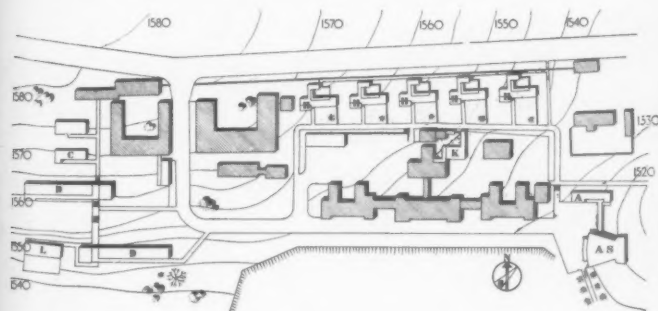
FRY, DREW AND PARTNERS

PRESBYTERIAN TEACHER TRAINING COLLEGE, AKROPONG

site The site, some 35 miles from Accra, on high ground, falls to the south-east. The school, which has been in existence for over 100 years, is within the town.

accommodation Existing buildings consist of a main school block of classrooms and dormitories on the southern side and a school for the blind on the east side. At the north-west entrance is a primary school with the original Mission house on the left. The problem in hand was to provide two further dormitories, an assembly hall and staff houses. The former of two storeys are grouped to the south-west and linked by stepped paths to an ablution block and laundry, workshops and sick bay being to the north. Five staff houses on stepped terraces have been placed along the north boundary while the assembly hall with linked administration offices and seating over 400, forms an impressive stop to the approach road. New kitchens, servants' quarters and garages have been added, and a further six staff houses have been built on a curved road south of the playing fields.

layout The dormitory blocks have been placed above a craggy outcrop of rock on the south-west corner of the site. The five staff houses have separate access and are individually grouped on the higher ground to the rear of the existing school block. The school has been well planted with variegated flowering trees such as flamboyants, tulip trees and cassias.



standard key to all site plans

- | | |
|----------------------|------------------------|
| A : administration | G : generator |
| AC : arts and crafts | H : staff house |
| AS : assembly hall | K : kitchen |
| B : breeze | L : lavatories |
| C : classrooms | N : north |
| D : dormitories | S : servants' quarters |
| DI : dining hall | SC : science |

scale: 1 : 2050

2, stepped path to one of the dormitory blocks.
3, staff houses looking west.

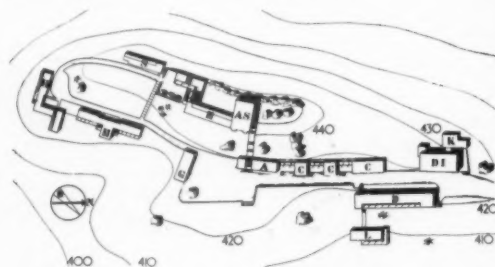


ST. MARY'S ON THE MOUNT, SOMANYA



4, dormitory block looking south.

5, on the left the dormitory block; right, classroom blocks.



site Somanya is situated near the Volta river, some fifty miles north of Accra. The site is an isolated saddle behind the town.

accommodation Originally planned as a small Catholic teacher training college for sixty boys, the scheme consists of a group of three individual classrooms with administrative offices and library in the centre of the layout. A dining hall and long dormitory block of three storeys precede these along the approach, but the most dominant feature is the chapel which towers above the remaining buildings from the highest point of the site. Linked with this are single-storeyed priests' cloisters, and kitchen and servants' quarters together with semi-detached staff houses complete the layout.

layout The site is approached by a curved steep-sloping road which continues between buildings to a central parking space. All buildings are sited to take full advantage of the south-west breeze.

ST. FRANCIS COLLEGE,
HO-HOE, TOGOLAND

site Centrally situated in Togoland, the site lies immediately outside the village of Ho-Hoe, and is approached by a long avenue leading to the existing mission house and up the gentle slope.

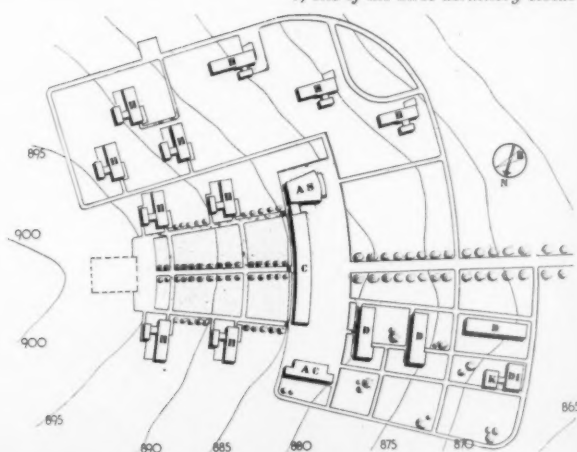
accommodation A long block of one-storeyed classrooms punctuated by the assembly hall at one end extends centrally across the site in a gradual curve, while two small dormitories of two storeys lie in front and to the north, accommodating 30 students each, with a larger dormitory in front of the dining hall and kitchen. An arts and crafts building forms a separated extension to the classrooms. Houses for the principal and senior staff are widely dispersed.

layout The direct approach and regular gradient of the site has been treated as a strictly formal layout. The impression of the school quadrangle is created by the placing of four of the staff houses with their intercommunicating paths to a fan-shaped pattern.



6, entrance to the assembly hall
7, one of the three dormitory blocks.

6
7



PREMPEH COLLEGE, KUMASI



8, south facade of main classroom block.

9, detail of classroom windows and brise-soleil.

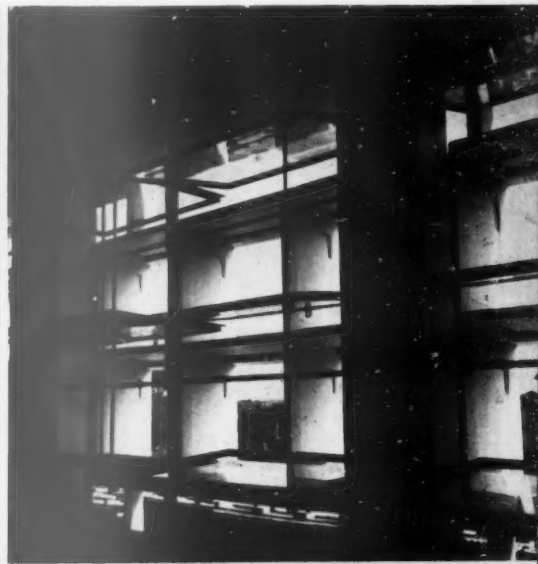
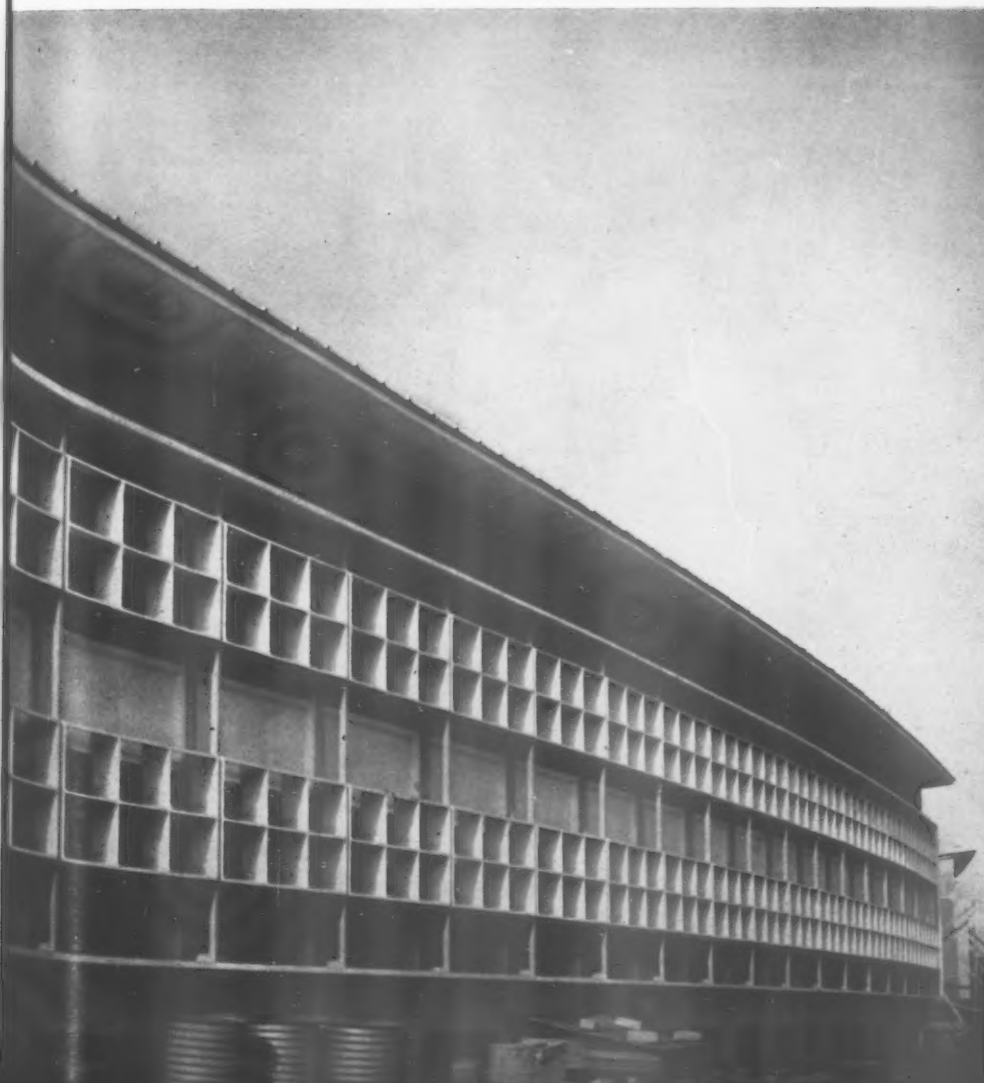
10, one of the seven two-storey dormitories. For waterproofing of the flat roofs in this college a bituminous insulating paste was used.

8/9
10

site Lying some four miles from the town centre on the road to Mampong, the site is on high ground which adjoins the hutted remains of a war-time military hospital, which has served meantime as temporary quarters for the college.

accommodation Four hundred and fifty boys have to be accommodated, and this is achieved by housing an average of sixty-five in each of seven two-storey dormitories. The dormitories running east to west differ from the remainder in that another module and type of treatment has been used, having been an earlier stage of the contract. Housemasters to each dormitory are accommodated in adjoining houses, and single members of staff are provided with a flat within the blocks. Common rooms are allocated to each dormitory, and lavatories are either attached or shared. The entrance is modelled with a large assembly hall seating five hundred and fifty, administrative offices and an extensive library on pilotis over the access itself. Curved classroom blocks extend frontally from assembly hall to dining hall. These include twelve classrooms, a science block to full complement, and a future block at the east end. They are grouped as three blocks, punctuated by cantilevered stairs from the continuous covered way on the north, while the south face is treated with brise soleil. The semi-open dining hall with kitchen stores and laundry make an effective terminus to the college quadrangle.

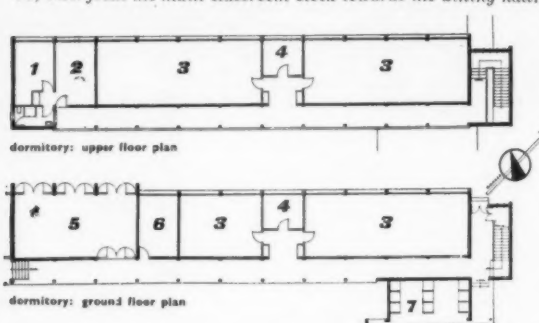
layout The curving nature of the contours has been followed in the character of the layout. All the buildings are linked by covered ways, as a protective means of access from sun and rain. A water tower is placed to form a focal point from the entrance, and it is hoped to add a chapel in the future. Building operations are expected to be completed very shortly.



PREMEPH contd.



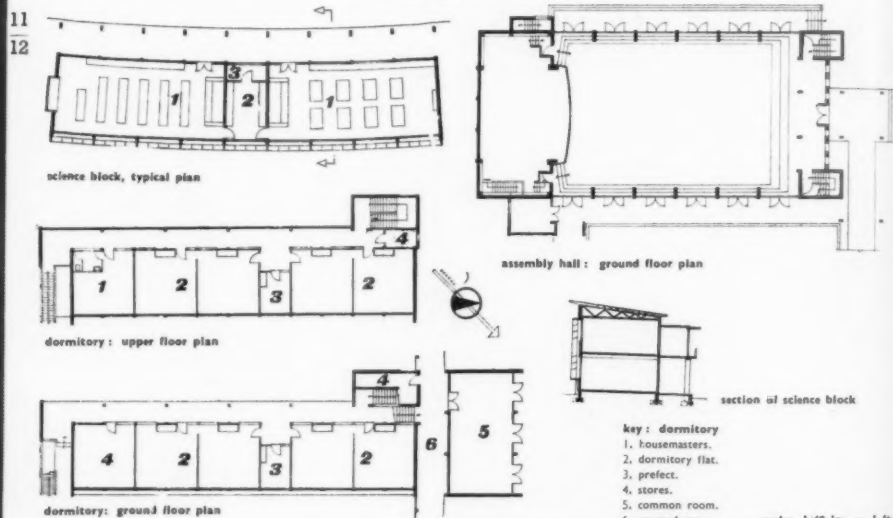
11, view from the north elevation of the main classroom block towards the dormitories.
12, view from the main classroom block towards the dining hall.



- key: dormitory plans
1. bedroom.
 2. living room.
 3. dormitory.
 4. prefects.
 5. common room.
 6. box room.
 7. showers.

Detailed planning of halls, dormitories and classroom blocks is approximately the same in all the schools and is therefore shown only once in the schools illustrated on this page.

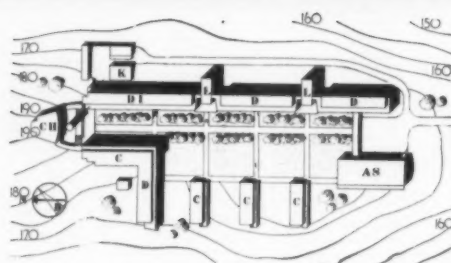
- key: science block
1. laboratory.
 2. preparation room.
 3. store.



- key: dormitory
1. housemasters.
 2. dormitory flat.
 3. prefect.
 4. stores.
 5. common room.
 6. covered way.

scale: 1/48 in. = 1 ft.

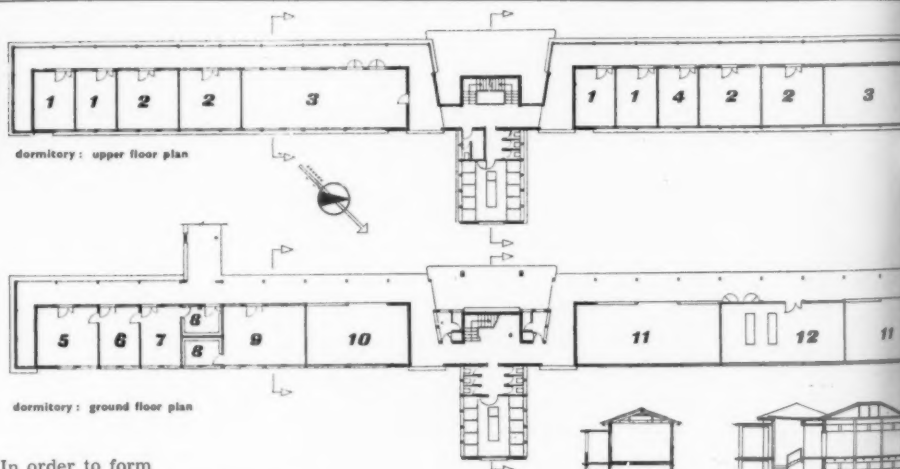
WESLEY GIRLS' SCHOOL, CAPE COAST



site A ridge site was chosen for this school. In order to form a common level of sufficient area for building, it was necessary to shave the top contour, filling round the perimeter with the spoil.

accommodation 250 girls of secondary school standard were required to be housed. To achieve a compact scheme four blocks were decided upon of three-storey height, incorporating administration offices, dining hall, science and geography rooms and junior staff. Classrooms were treated as independent one-storey buildings. The assembly hall at the south end, balancing with the raised chapel at the north, is linked to the administration offices by a covered way to complete the effect of a large, airy quadrangle. Mains water is available and is piped to a water tower in front of the chapel which dominates the site and forms a sculptural focal point.

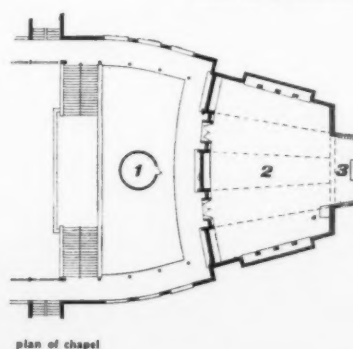
layout A curving approach road climbs the hillside and terminates for wheeled traffic in a forecourt adjoining the assembly hall. Verandahs extend for the full length of the buildings giving a means of access protected from sun and rain. Staircases and ablution blocks have been treated as punctuating features within this length. Staff houses, not shown on the layout, are placed just off the approach road on the hillside.



- key: dormitory plans
1. junior staff.
 2. senior room.
 3. junior dormitory.
 4. box room.
 5. headmistress.
 6. vice-head.
 7. bursar.
 8. stores.
 9. general office.
 10. junior staff common room.
 11. common room.
 12. day girls' locker room.

section through dormitory

section through staircase



- key: chapel
1. water tower.
 2. chapel.
 3. altar.
 4. pulpit.

13, view of chapel from churchyard.
14, rear view of dormitories. 15, library stairs. 16, assembly hall seen from the chapel.

ermi-
ap-
hools
ce in
ge.

3

11

h staircase

13

14/18/16

apel

yard.

view of

15, lib

rs. 16,

all seen

apel.



ADISADEL COLLEGE, CAPE COAST. Extensions

site The site offered is situated on the northern slopes of the hill on which the existing college stands just outside Cape Coast.

accommodation Biology, physics and chemistry classrooms with a lecture hall and the relevant preparation rooms and stores are provided in a central science block of two storeys, with full lavatory accommodation below to serve the dormitory blocks. These have been arranged either side of the science block at right angles to house sixty students in each. They are two-storey buildings which extend to three floors at the lower end of the site, and these give common room space for the pupils. At the lowest extremities, married staff houses with a compound to the rear are attached. Roofs are of single pitch and stone walling is extensively used below floor level. The predominant feature of the design is the pre-cast balustrade which continues along all verandahs.

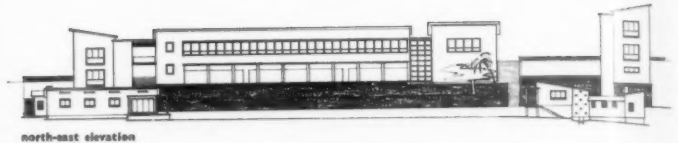
layout Since ground space was strictly limited, and the site in question slopes sharply away, a concentrated layout with science block and dormitory entrances placed as near to the existing buildings as possible on the south side was considered to be the best solution, rather than a more extended layout down the hillside.

17, east facade of dormitory block (see also frontispiece, page 282).

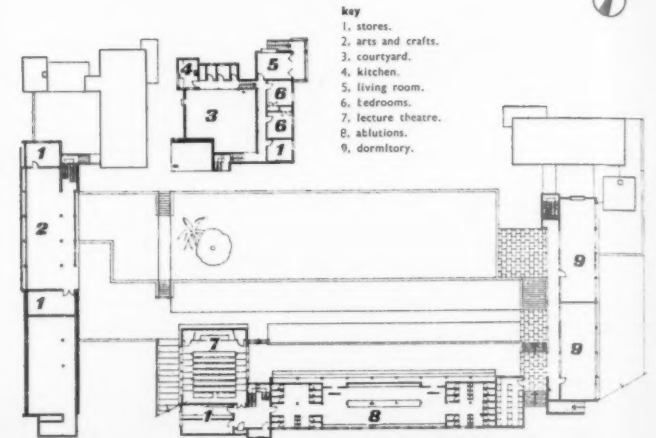
18, south block; upper floor houses science lecture rooms.

19, east facade of dormitory block looking north.

17
18
19



north-east elevation



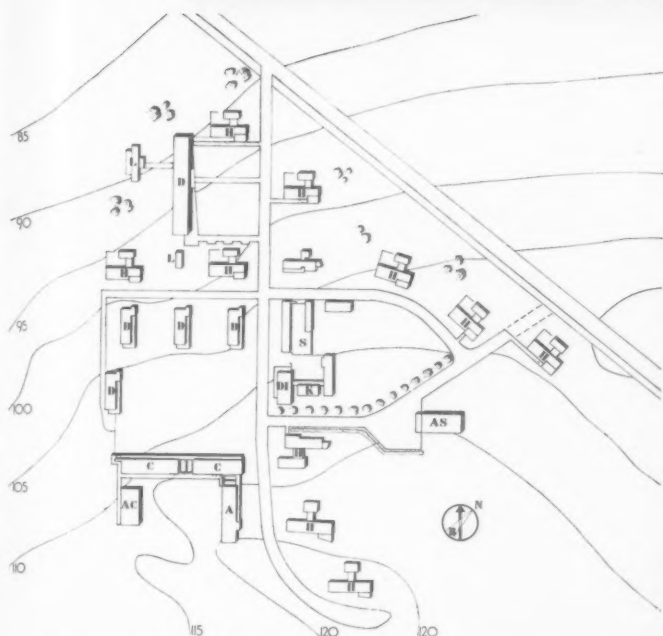
ground floor plan

- key
- 1. stores.
 - 2. arts and crafts.
 - 3. courtyard.
 - 4. kitchen.
 - 5. living room.
 - 6. bedrooms.
 - 7. lecture theatre.
 - 8. ablutions.
 - 9. dormitory.

scale: 1:960



ST. JOSEPH'S TEACHER TRAINING COLLEGE, BECHEM



20, entrance to classroom block.

21, pergola between classrooms. In this college as well as Prempeh the roofs were waterproofed with bituminous insulating paste.

20
21



site The site, situated in the forest belt of Ashanti, some fifty miles north-west of Kumasi, exists as a forest cutting housing a small community at a distance of about a mile from the village of Bechem.

accommodation Originally designed as a teachers' training college to house sixty male students, extensions are now in progress to take a total of one hundred and twenty. This is achieved with four small dormitories housing fifteen students each, and a subsequent larger dormitory for sixty. All staff members have houses, and a dining hall and assembly hall cater for students, with kitchen and laundry grouped at the rear. There are some eight classrooms merged into a single block opposite the dormitories, embracing arts and crafts, library and administrative offices. A small dispensary with sick bay is included.

layout The scheme is approached by a central road subdividing the majority of staff houses from a lawned forecourt on to which dormitories and classrooms face. The dormitories are faced north and south to obtain the benefit of the south-west breeze.

PRESBYTERIAN TEACHER TRAINING COLLEGE, AMEDZOFE, TOGOLAND



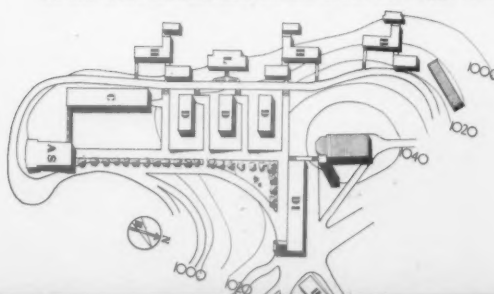
22
23

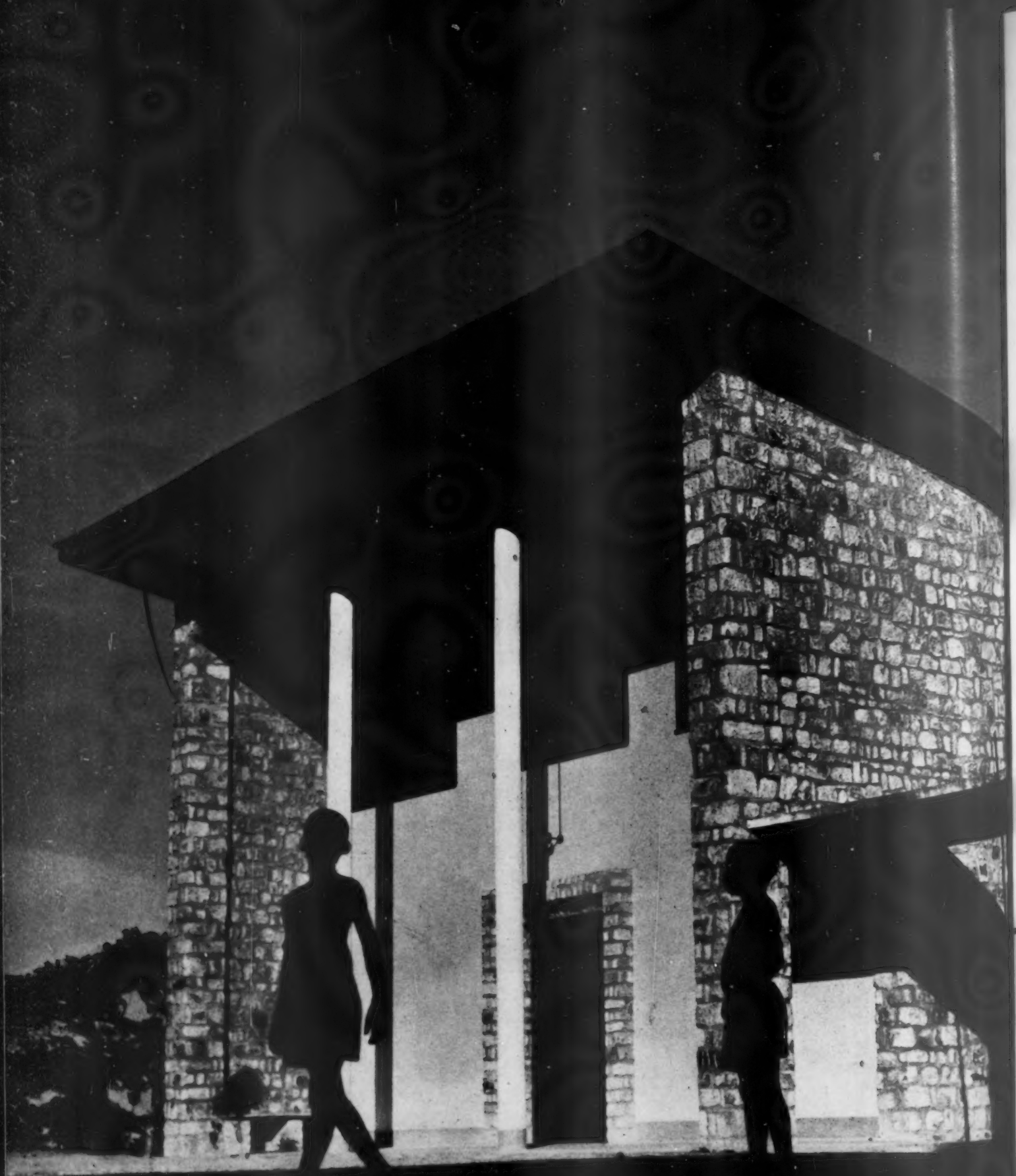
22, entrance to dormitory block.

23, dormitory blocks looking south-west.

site First of the Gold Coast schools to come under consideration was this Presbyterian college situated in the more mountainous area of Togoland.

accommodation Three two-storey dormitories accommodate 120 boys and an assembly hall with a gallery is provided. The longest blocks are the dining hall at the north entrance and the classrooms with administration which is linked to the assembly hall by a covered way. Staff houses are situated on the west hillside and on the north-east approach.





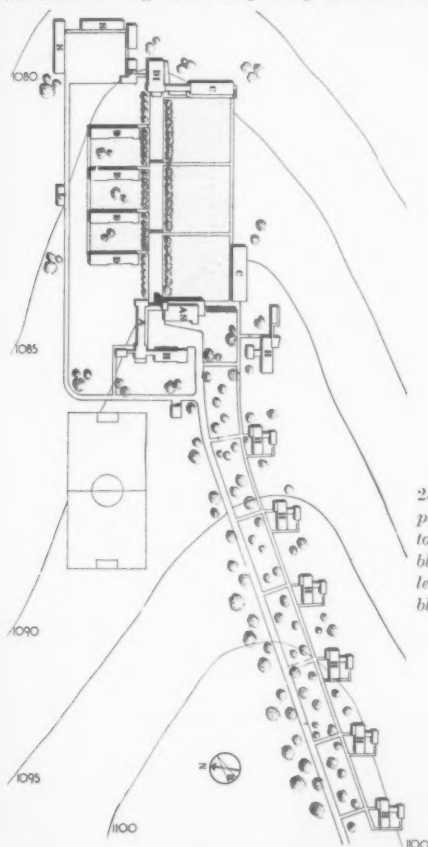
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ST. ANDREW'S TEACHER TRAINING COLLEGE, MAMPONG

site This site is some thirty-five miles north of Kumasi and situated on top of a high escarpment.

accommodation As a teacher training college for 120 male students, dormitory accommodation is arranged in four blocks for thirty students with ablution facilities and a junior master accommodated. These extend from large grassed terraces stepped at three levels which are bounded on the west by three classrooms and combined chapel and assembly hall, and on the east by an arts and crafts block and dining hall with kitchen, laundry and servants' quarters. Offset from the long approach of the main road to Kumasi are six senior staff houses which are terminated by a larger principal's house, with guest quarters, near to the assembly hall.

layout All buildings have been oriented to give a 45° striking angle from the prevailing south-west breeze, and the approach road is fringed with flowering trees which give a woodland setting and some privacy to staff houses.

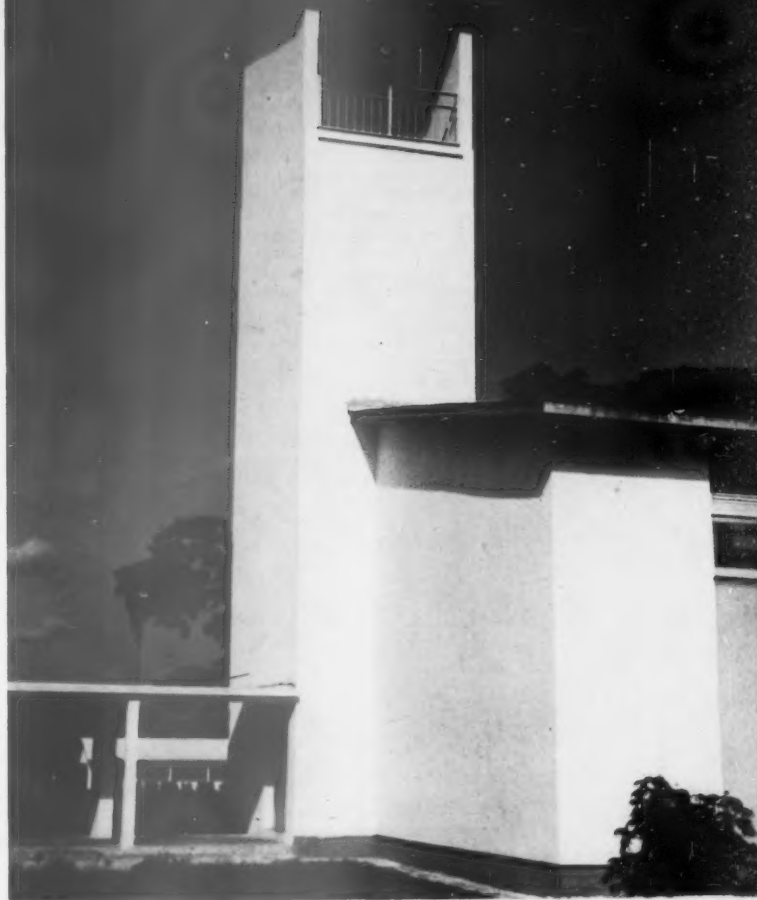


25, general view from the playing fields. 26, the tower north of the assembly hall with covered way leading to administration block. 27, staircase detail.

24, opposite, entrance to assembly hall, with covered way leading to classrooms.



26
25/27

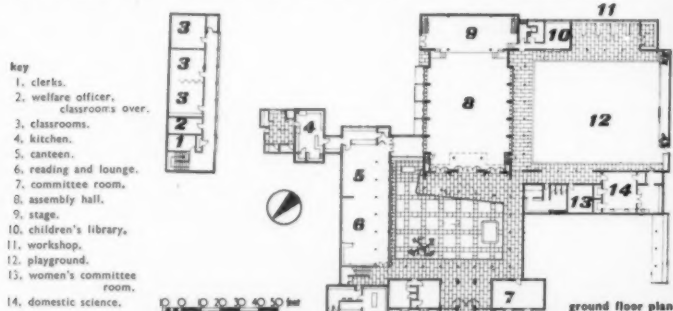


COMMUNITY CENTRE, ACCRA

site Situated in a prominent position between the Christianborg Road and the sea, a large flat site of more than twenty acres, well elevated, was chosen.

accommodation The following have been provided: sports grounds with a short running track, main committee room, men's changing rooms and lavatories, with similar accommodation for women, with domestic science kitchens in the south-west wing, a lounge and reading room, with canteen and snack bar, served by kitchens, rooms for the welfare officer and his clerk, three classrooms used for adult education, assembly hall (sometimes used for dinners and dances) which seats nearly four hundred, equipped with a stage and dressing rooms beneath, and a projection box for cinema performances, a small pool, a children's playground, a library and open workshops for crafts.

layout The need for cross ventilation has dictated an open type of layout, combined with enclosed courtyards which are traditional with the African feeling for a sense of security.



28, the main entrance looking towards the assembly hall.
29, colonnade in the courtyard.
A mural at this community centre was designed by the African artist Kofie Antuban.

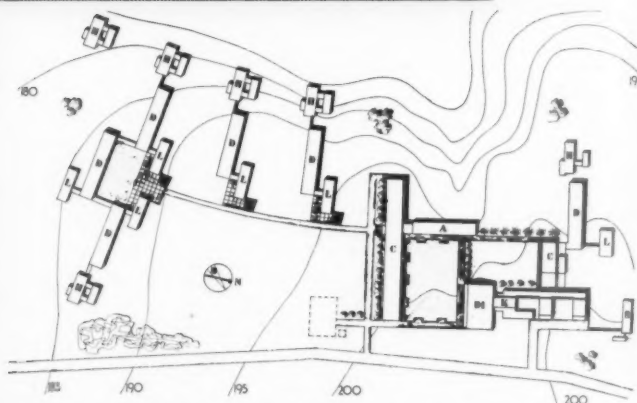
28/29



OPOKO WARE SCHOOL, KUMASI



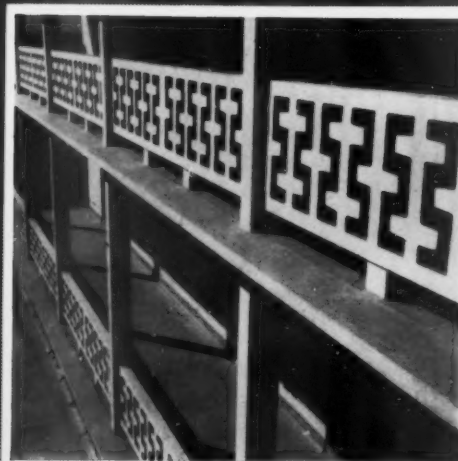
30, dormitory and master's house looking west.



site The school is situated a few miles outside Kumasi.

accommodation The school accommodates 360 boys housed in six 2-storey dormitory blocks, each with its separate staff house and ablution block. The central east-west block contains ten classrooms, with three science laboratories and a lecture theatre; a north-south administration block contains staff offices, library and staff common room; a combined dining and assembly hall to seat 500 people.

layout The dormitory, classroom and ablution unit at the extreme north of the site was built to serve as a self-contained unit. The central classroom, administration and dining hall block form a quiet, enclosed quadrangle and the kitchens, garage and laundry to the north of the dining hall are easily accessible from the Kumasi road with a minimum of road works.



31, detail of the balustrade of the science block of Mfantsipim College, Cape Coast.

310

Neville Ward

SPACE HEATERS

A SURVEY OF GAS, OIL AND ELECTRIC UNITS

Every technical advance warrants its own aesthetic expression. But though technical and aesthetic changes should go hand in hand, when technical advances are rapid, design changes frequently lag behind. This explains why the most satisfying aesthetic expressions are often achieved during periods of limited technical development. Transition is slow from the crude rush light to the chandelier, or from logs on an open hearth to an Adam fireplace.

When time and experience are limited in relation to the speed of technical development chance tends to dominate the scene; the chance of an existing component; the influence of an irrelevant form. Such is the situation in the field of space heating. The aesthetic virtues of the best heaters today are mainly negative ones, an efficient source built into a form as innocuous as a water-colour mount.

One manufacturer of radiant heaters at least has now stated that electric fires do not pretend to imitate the coal fire. This is the right frame of mind to approach the problem. But it must not be forgotten how the open fire delights and beguiles us, and is the very epitome of home. Unless it is accepted that both gas and electricity can provide only for intermittent or secondary use, or that heat sources shall cease to be the focal point of the room, they must eventually afford some compensating pleasure of their own.

The form which this development will take cannot be foreseen, but it must be in the nature of an aesthetic discovery. To our present understanding, that is to say by com-

parison with a coal fire, gas has a distinct advantage over electricity in its lace-like elements and the tiny fluctuations of the jets. These are minor pleasures which might be exploited further.

Assuming that the English convention of a heat source forming the focus of a room is to be discarded, convection is clearly an efficient answer to space heating over long periods. This is particularly so in the case of gas heating. With the introduction of the balanced flue, a recent technical development, an efficiency of 75 per cent. is achieved compared with the best radiant heater at around 50 per cent.

The flueless gas convector has an even higher efficiency figure (90 per cent.) but its application is restricted by a limitation on the amount of gas which may be consumed in relation to the volume of air available. For electric heat there is no economic advantage in convection over radiation though there is probably gain in that the whole room is evenly heated.

An interesting new development based on an old principle is the electric storage heater. In this, power is used at off-peak periods to heat a mass of stone or concrete which then releases heat slowly during the time when the demand for electricity is greatest. Only large users who are in a position to negotiate for a preferential off-peak tariff can benefit from this arrangement. Its use for domestic purposes is therefore restricted except where a number of dwellings are being dealt with as a single development.

Convection heaters are obviously desirable for those people who like air temperatures around 70 degrees. Many people in this country, however, prefer an air temperature of between 55 and 60 degrees, with some radiant heat in addition. With this in mind manufacturers of gas and electric heaters are producing appliances giving both radiant and convected heat simultaneously.

In the field of oil-burning heaters, where technical developments have not been marked and a vernacular developed from the lamps of the past might reasonably be expected, the state of affairs is not much different. Though the new heaters are less smelly, less dirty and easier to fill than those of the past, unhappily all the pleasurable features which distinguished the oil stove from any other source of heat—the coloured glass peepholes and the perforated casings which threw exciting patterns on the ceilings—are fast disappearing. With certain exceptions such as the 'Aladdin' blue-flame heaters, new designs tend to reproduce features associated with, and more reasonably a part of, gas and electric heaters.

Change in design in all these forms of heating has been painfully slow, so that this article is in the nature of an extension of the 1946 survey*. The Gas Industry, for example, having brought to our attention, as the latest developments, some of the heaters then illustrated.

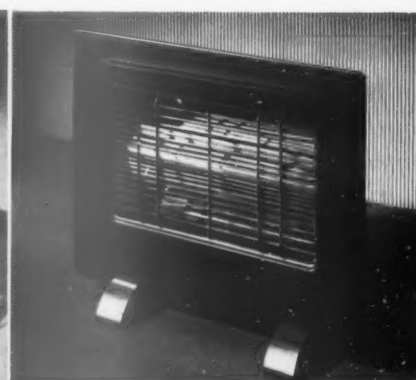
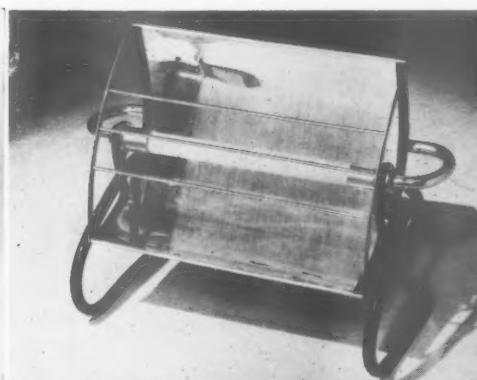
The generally poor aesthetic standard in domestic heating equipment is all the more strange when it is realized that many of the firms producing the heaters also manufacture excellent light fittings. Clearly tooling costs are high and there is little incentive to consider new designs when national policy is to direct demand away from the product. Yet it is regrettable, in view of the physical and social importance of space heating, that there should have been such a lamentable failure to advance.

* ARCHITECTURAL REVIEW Design Review Issue, October 1946.

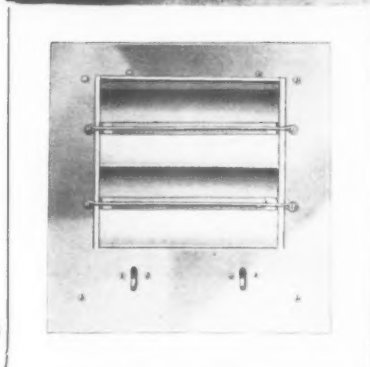
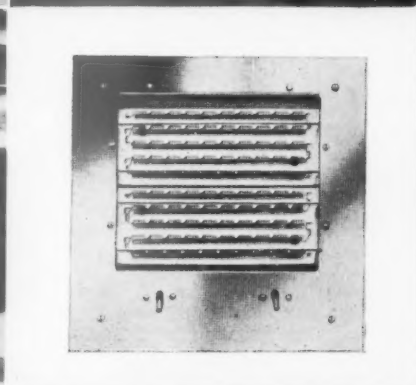
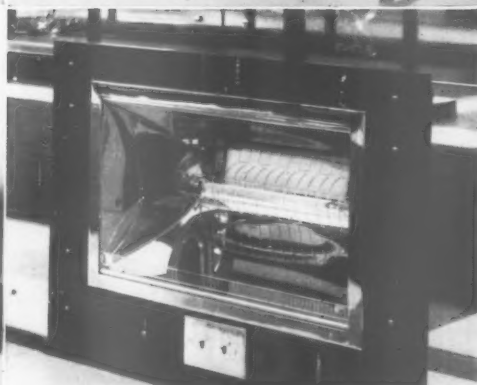
Illustrated are a selection of heaters currently in production. Technically the most interesting are perhaps the Sapphire and Dru-Gasojar balanced flue heaters. These do not require the building of a normal flue, thus saving considerably on building costs. They are ventilated by a short duct drawing air through a terminal in an exterior wall which then passes over the burners and, carrying the by-products of combustion, is vented through the same terminal. Other heaters shown here are the electric storage heater and gas heaters in which convected heat as well as radiant heat are made available.



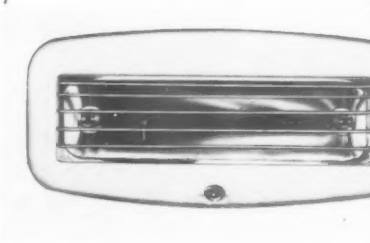
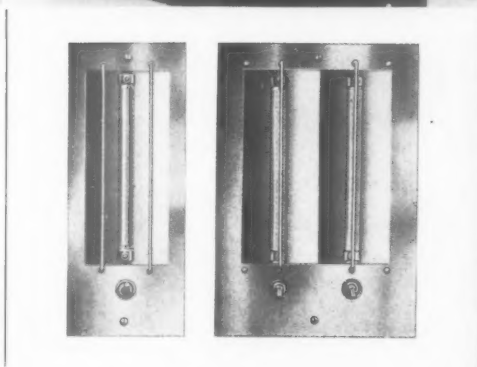
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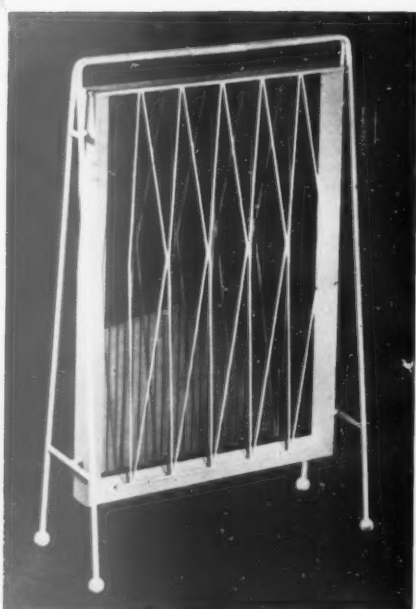
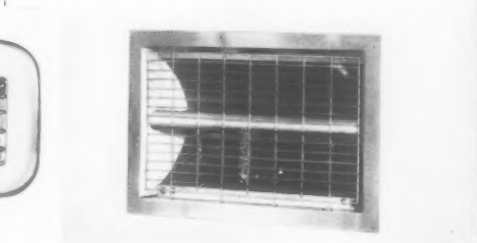
4, 5, 6



7, 8

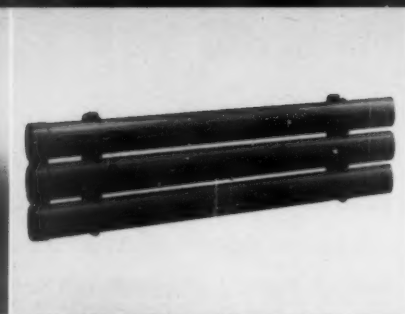
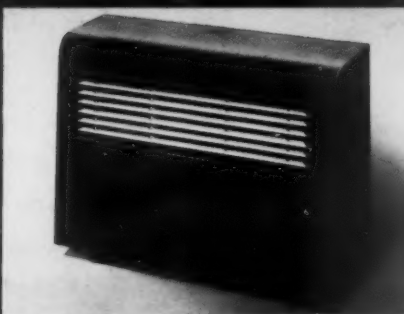


9, 10, 11

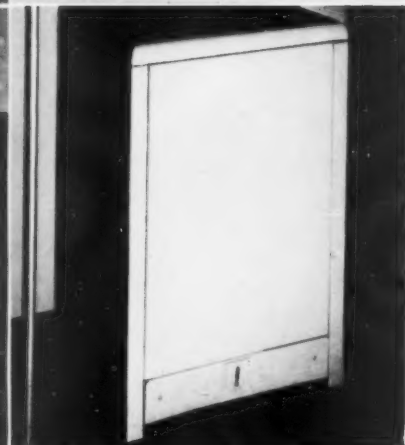
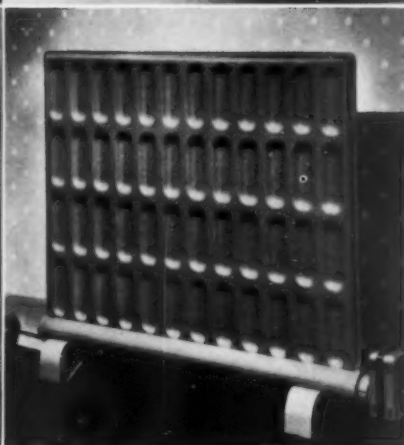
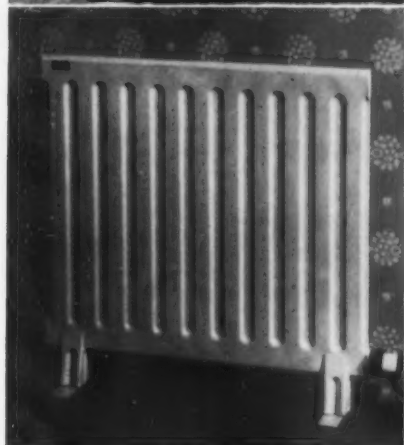


radiant electric The bowl fire must have been one of the earliest types of electric fire. It is still so good as a type that almost every manufacturer makes one. 1, by Nico Light Engineering Company, is a good straightforward version designed in 1944 and still current (£2 18s. 0d.). Three Portables. 2, a 2 kw. made by Morphy Richards (£4 15s. 5d.). 3, Ferranti's 'Safera' designed by W. N. Duffy. A mercury switch cuts out this fire if it is knocked over or tilted more than fifteen degrees from the vertical (£13 17s. 7d.). 4, the 'Bruton' de luxe model with a specially moulded reflector giving a wider angle of radiation. Made by H.M.V.

Household Appliances (£17 5s. 10d.). Six fixed panel heaters; 5, heater designed in the '30s by W. N. Duffy for Ferranti and still one of the best (£27 19s. 6d.). 6, 7 and 8, four heaters made by Electroway (£5 9s. 4d., £6 4s. 11d., £3 12s. 0d. and £5 10s. 0d.). 9, has been designed for permanent wall mounting without the need for cutting a recess. Made by Creda (£4 6s. 9d.). 10, Ferranti space heater with shielded element making it a safe fire for nursery use (£10 19s. 10d.). 11, portable with metallic element deposited in plate glass panel and therefore completely safe. Made by Premier Electric Heaters (£19 19s. 0d.).



12, 13, 14

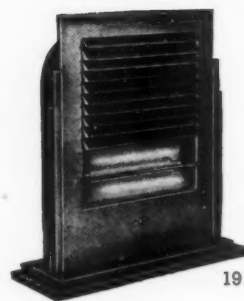


15, 16, 17

electric convectors 12, a well-designed heater for marine use. Steel outer casing has clip fixings which facilitate removal for cleaning or inspection. A double duct assembly ensures a low temperature of the outer casing. Designed by J. K. White for E. K. Cole (approx. £15 0s. 0d.) 13, a classic of the 1930's still in production. This has had a good deal of influence on the design of electric heaters and was the forerunner of number 12 (also made by E. K. Cole). 14, tubular heater by Maxheat, intended largely for background heating. The oval section reduces the projection from its fixing surface to a minimum. (£7 10s. 0d. to £9 0s. 0d. according to size). 15 and 16, oil filled electric radiators which can give the characteristics of a central heating system at a very low installation cost. 15 can be fitted with castors for easy moving. Made by Hursel (£17 15s. 0d.). 16 is thermostatically controlled. Made by Dimplex (£24 4s. 9d.). 17, storage heater using off peak current at night and continuing to emit heat during the day. Suitable for large installations where beneficial tariffs can be negotiated. Made by Thermadore (1 kw. £11 7s. 7d., 1½ kw. £12 10s. 8d., 2 kw. £12 19s. 0d.). 18 is a heater

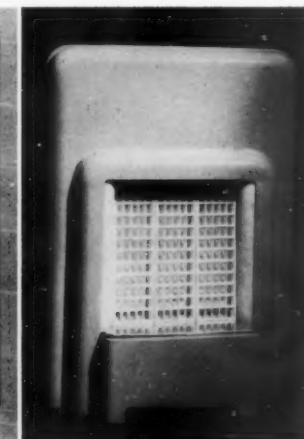


18



19

fitted with a fan to stimulate the circulation of air and distribute warmth. Fan can be operated without heater during summer. Made by Delaney Gallay (£21 0s. 0d.). 19, heater providing both radiant and convected heat. The lowered panel is illuminated to give a warm glow. Made by Hawkins & Co. (£8 19s. 7d.).



20, 21, 22, 23

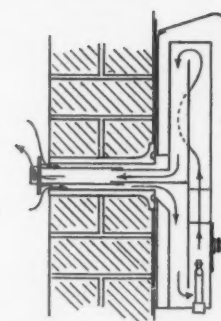
radiant gas 20, a strong and inexpensive portable gas heater. All metal, including the heating element. This is a pleasant free standing object and the form of the element suggests that the much needed 'all-round' portable heater is a reasonable possibility. Made by Ascot Water Heaters (£5 7s. 10d.). 21, another portable fire with the sturdy heating elements so important in a heater of this type. Made by Radiation

(approx. £10 6s. 0d.). 22, a stainless steel fixed heater for use in a normal fireplace. The tap is placed well away from the heat source—a point not always considered in the designing of gas fires. Made by Bratt Colbran. 23, a fire of similar form to number 22 but with a vitreous enamel finish to the surround. Easy to clean and one of the cheapest fires of its type on the market. Made by Bratt Colbran (£10 0s. 10d.).

24, 25, 26, 27



28, 29, 30



31, 32, 33



gas convectors 24, a background heater, was designed before the war. Made by Flavell (£4 19s. 3d.). 25, made by Radiation (£16 16s. 6d. or £20 1s. 6d. according to size). 26, another type of flue-less heater, with radiant element, made by Bratt Colbran (no longer available). 27, made by Radiant Heating (£9 17s. 2d.). 28 and 29, two heaters with balanced flue. Technically by far the most important development in gas heating since the 1946 Review is the balanced flue convector. The 'Saphire 10' and the 'Saphire 20' are the only models made in this country up to now, and are produced by Coxper Penfold & Company ('10,' £20 12s. 9d.; '20,' £37 1s. 4d.). 30, shows the construction of the balanced flue which consists of an air duct for combustion which, continuing past the burners,

forms a flue for the removal of combustion products, both the intake and vent being in the same position at a suitable terminal on the outside wall. It will be seen that this arrangement practically eliminates the cost of flue building. 31, medium temperature heater. The Dru-Gasojar is a widely used continental heater now being imported to this country. It gives both radiant and convected heat and incorporates a balanced flue. Available in seven sizes. 32 and 33, convection heaters with radiants. 32, very much more efficient than the simple radiant fire. It was reviewed in 1946 but remains an outstanding technical development. Known as the 'CR' fire, it is made by Allied Ironfounders (£15 6s. 8d.). 33, a new model made by Radiation (£22 5s. 0d.).



oil These heaters give predominantly convected heat. 34, a simple type of oil-burning heater on traditional lines, made by Morris Heating Appliances (£6 0s. 0d. small size, £7 5s. 0d. large size). 35, portable odourless cabinet heater, made by Morris Heating Appliances

(£10 10s. 0d.). 36, oil burning radiator, made by Aladdin. This is both economical and reliable and one of the best designs of its kind (£9 19s. 6d.—no tax). 37, Aladdin blue flame heater. Yet another well-designed job on traditional lines (£5 7s. 6d.—no tax).

current architecture recent buildings of interest briefly illustrated



1, the council chamber in one of the aluminium wings. 2, the main facade

COUNTY OFFICES AND COUNCIL CHAMBER AT DOLGELLY, MERIONETH ARCHITECT: NORMAN L. JONES

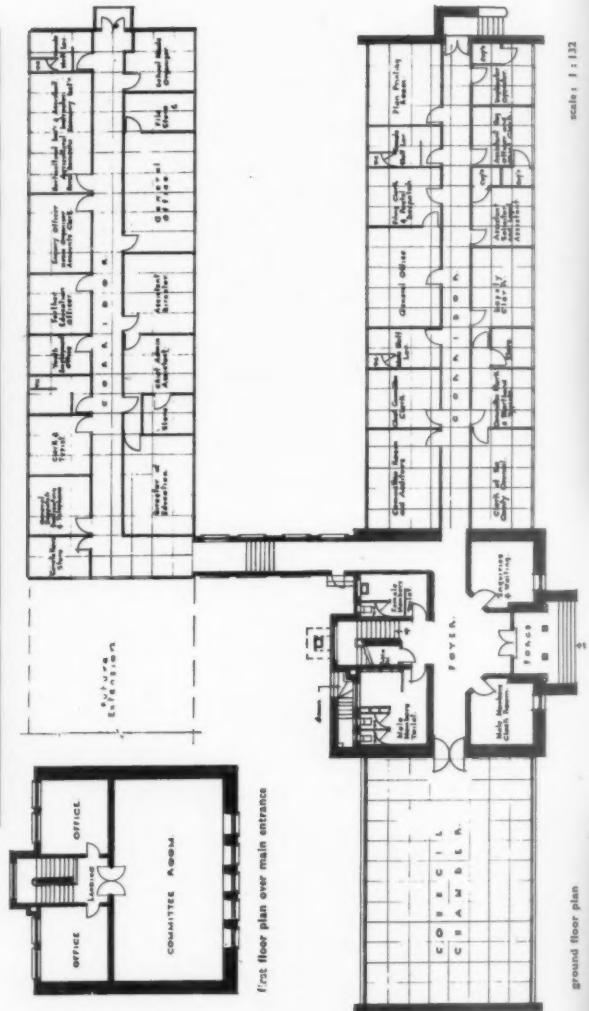
The dominant feature of this group of offices is a two-storey central block in local and traditional stone. On either side are single-storey wings of Bristol Aeroplane Company's aluminium unit construction, finished in a shade of gunmetal grey which harmonises with the stone and with the

2



building's surroundings. Behind this frontage is a further group of aluminium buildings, linked by a corridor to the central block and planned in such a way that, with the erection at a later date of a block of finance offices, the whole scheme will form in a plan a letter 'H'.

The floor of the Council Chamber is sunk below the general floor level of the building to give an impression of height and an air of dignity. The floor is of polished hardwood, and the internal woodwork and furniture natural oak. Seating has green hide coverings.



ground floor plan

scale: 1:122



6, from the southwest. 7, below, view at gutter level showing booms and wind bracing.



Scale: 1 : 1293

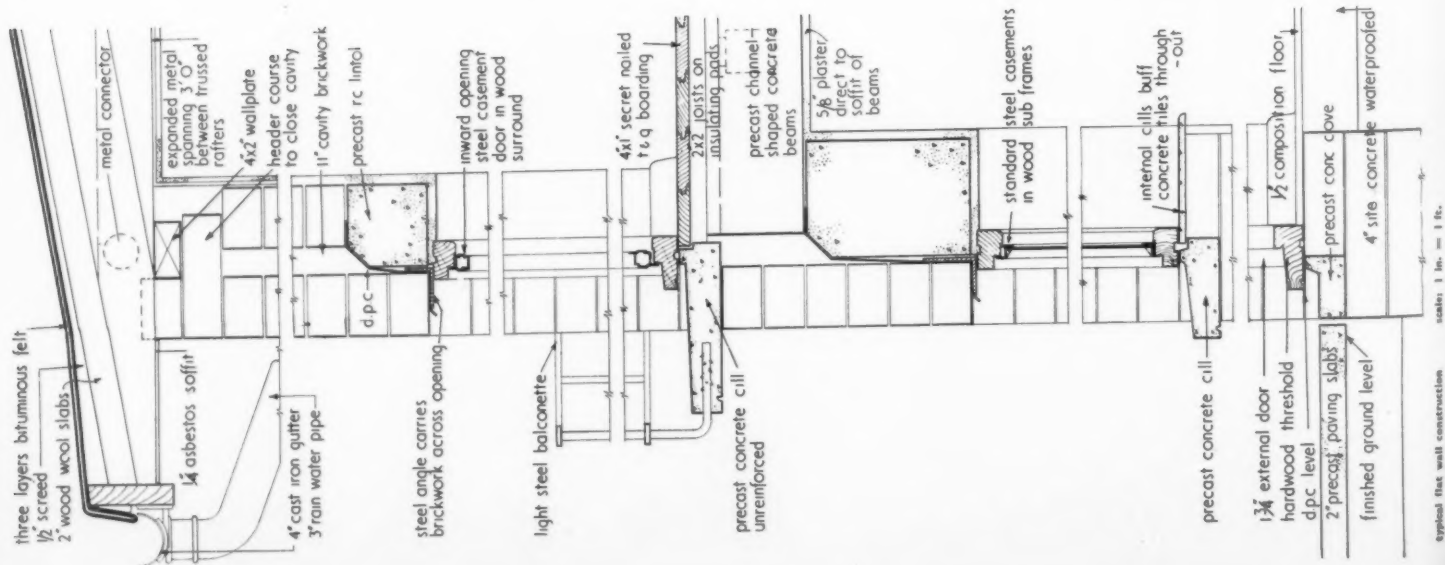


WORKSHOPS AT EAST HAM, LONDON
DESIGNERS: BRIAN COLQUHOUN & PARTNERS

These mechanical workshops replace old, obsolete and scattered units which have long been inadequate for the growing needs of the North Thames Gas Board's Tar and Ammonia Product Works. The site is flat and was chosen to give ready access both by road and rail. The building accommodates all the necessary engineering shops, boiler-makers, blacksmiths, welders, plumbers, electricians, tin-smiths, engine fitters and pipe fitters, together with their ancillary stores, administrative offices, drawing office, etc. There is also an area for locomotive repair. North lighting had to be provided for as large and unrestricted an area as possible, and accommodation covering some 80,000 square feet consists of four bays, each with a span of 70 feet. There is a large assembly area, which is readily accessible to all the crafts for building and repairing the large units of plant. A checking station is provided adjoining the loading dock, to enable materials received by road and rail to be delivered correctly into the various store areas. The administrative offices on the first floor on the east side are divided from the main workshop area by a glazed, sound-proof corridor running the complete length of the building. The superstructure is carried on reinforced concrete piles, which support precast concrete ground beams. *Alumincus* cement has been used generally for work below ground as a precaution against acid-impregnated sub-soil. The main workshop area is steel framed: lattice piers carry the overhead crane rails and continue into the roof to support the steel roof trusses. As each group of three roof trusses spans 70 feet booms and wind bracing form external members.



5, the south facade looking west.



FLATS AT HATFIELD NEW TOWN

ARCHITECTS: LIONEL BRETT AND KENNETH BOYD

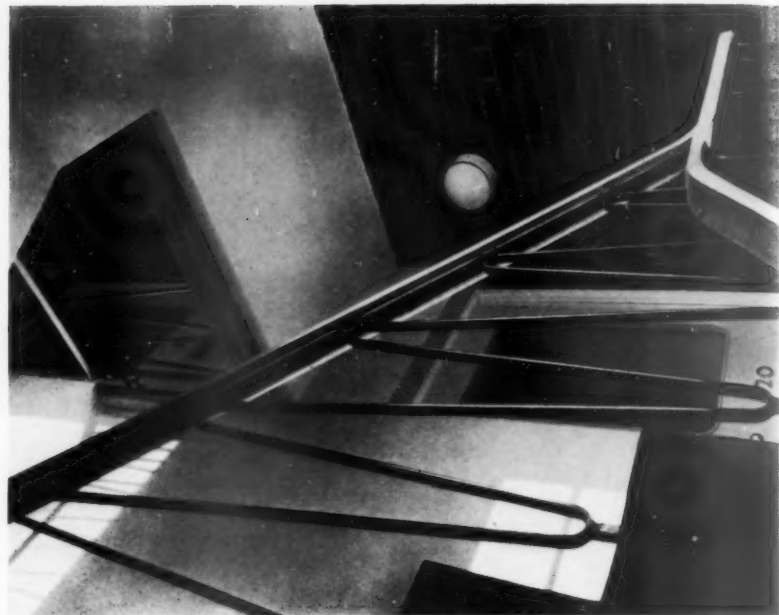
The Roe Green neighbourhood is the first area in Hatfield New Town to be developed. Work started here in July, 1950. The neighbourhood will eventually contain a population of approximately 5,000 and of a total of ten building contracts, seven have been started. Proximity to the New Town centre dictated a comparatively high density and the contours required a flexibility in grouping. Types Fa and Fb flats are both two-bedroom flats, the former type are 646 feet super and are built against the contours; the latter are 626 feet super and the blocks are built with the contours. With type Fa flats the contours are negotiated by articulation at the staircase link and handing about spine walls enables all living rooms and balconies to face south and west. Fb flats are on level sites and have a traditional plan, but avoiding long internal corridors to bedrooms. Included in the neighbourhood are terrace houses with three bedrooms, and dining-kitchen, and are 1,081 feet super in area. These houses have a 25-foot frontage and a through passage affording insulation between neighbouring living rooms and lockable storage. There are loggias on the garden side to give increased privacy. Other houses are semi-detached and have a traditional arrangement of rooms and screen walls on garden sides in place of loggias.

The type Fb flats have load-bearing brick walls, 13½ inch solid to the ground floor and 11-inch cavity above. The timber roof trusses are at 10 degree pitch and 3-foot centres. There are timber floating floors to living rooms and bedrooms on patent concrete trough beams. Houses also have load-bearing walls with a brick outer skin and an inner skin of 3-inch hollow clay blocks. The 8½-inch party walls have two skins of 3-inch hollow clay. The timber roof trusses have a pitch of 33 degrees or 25 degrees.

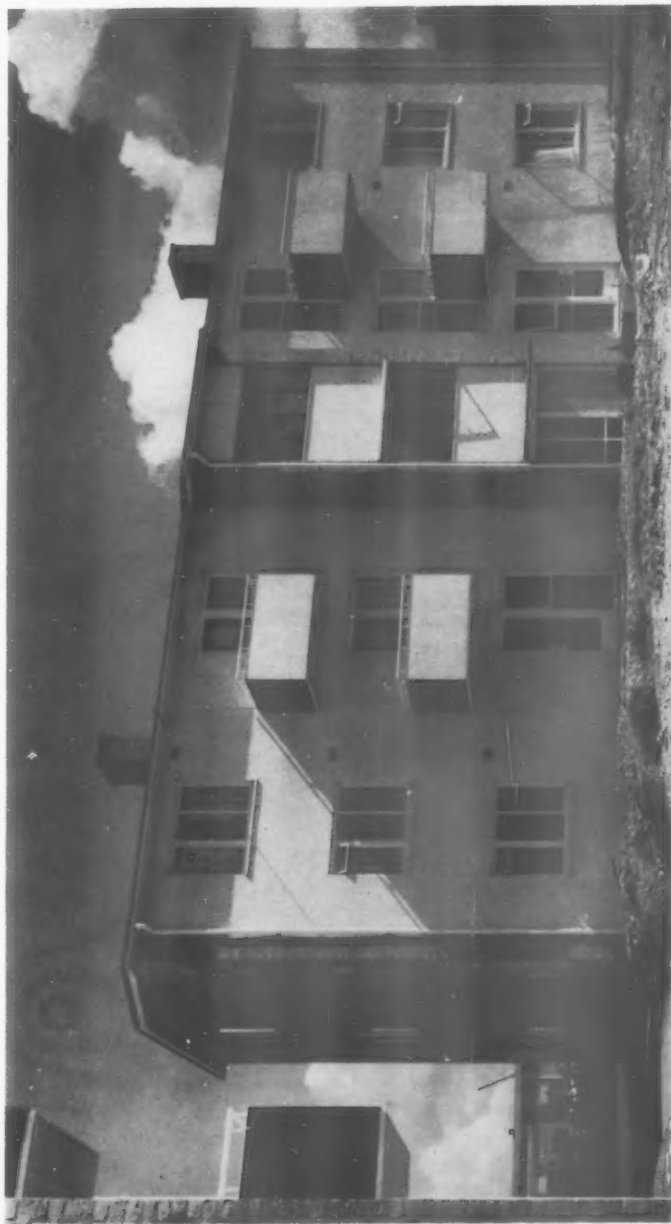
The traditional local preference for London stock bricks and local red facings has been maintained. Roofs of flats are finished with 3-layer felt, ¾-inch screed and 2-inch wood wool. For houses asbestos slates are widely used in conjunction with stock brickwork. Kitchens and bathrooms have a composition floor finish laid on inverted trough beams. Internal colour schemes have been prepared for each house and flat type. Preferences by the earliest tenants for cream and green are now rarely expressed, and experiments with colour in small room spaces continue.

All houses and family flats are equipped with a back boiler open fire heating in turn calorifier and radiators. There are immersion heaters and gas water heaters for sinks for summer use. All kitchens are equipped with a refrigerator.

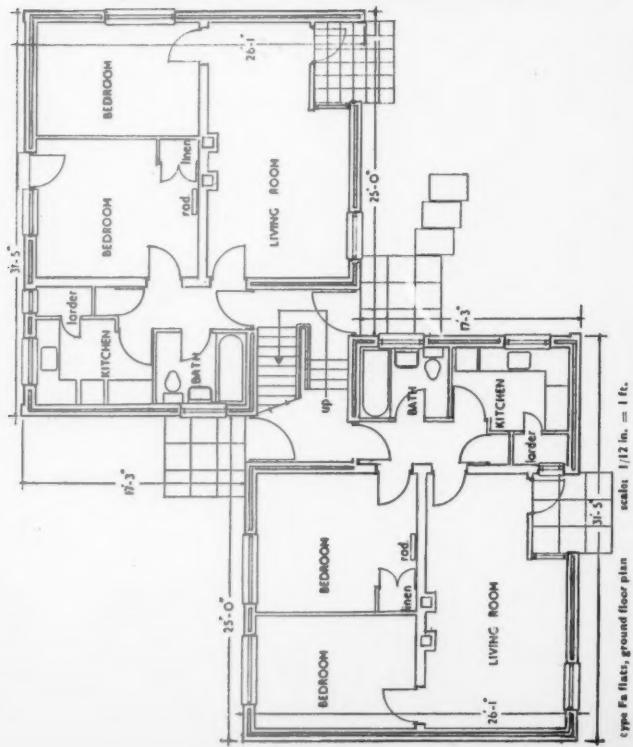
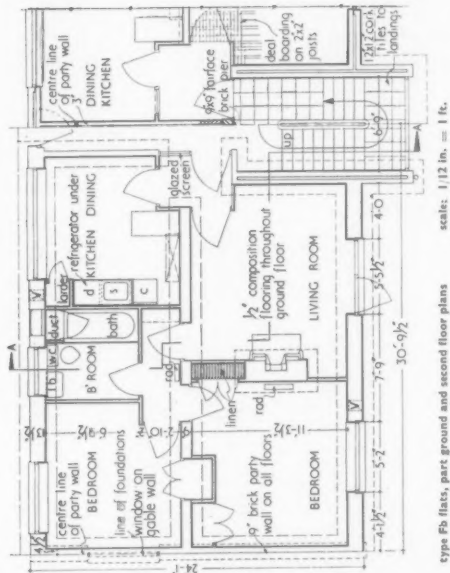
The contract prices (July, 1950) are: Type Fa flats, £1,138; type Fb flats, £1,090; houses, £1,174 and £1,201.



8, typical staircase to flats.



9, type Fb flats from the west.



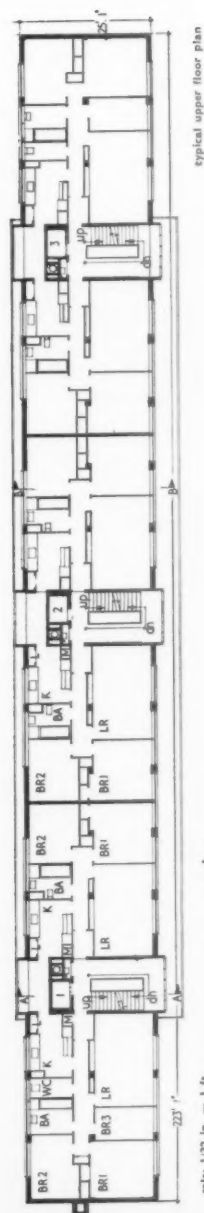
10, type Fa flats from the east.

FLATS AT ILFORD, ESSEX

DESIGNED BY L. E. J. REYNOLDS
ARCHITECT: H. B. N. NIXON

This seven-storey block for the Ilford Borough Council consists of 38 flats for the middle-income group, and occupies a 2-acre site, on which originally stood semi-detached industrial buildings. The density is 90 persons to the acre. There are fourteen three-bedroom flats, twenty-four two-bedroom flats, a laundry, work-room, games room, stores for prams, and garages. The reinforced-concrete frame is designed on a 12-foot square grid on plan, 10 foot where staircases occur. The staircase walls, which are 6-inch solid reinforced concrete, are designed as vertical cantilevers to resist wind pressure on the whole wall face, in conjunction with the north and south walls of the block. External panel walls are of 9-inch cavity construction, consisting of a 4½-inch outer skin of facing bricks, a 2½-inch cavity and a 2-inch inner skin of keyed hollow blocks. Internal partitions are constructed of two breeze block skins, one 3 inches the other 2 inches, divided by a 4-inch cavity for sound insulation. Expansion joints pass through the entire building at these points. The reinforced-concrete beams in the floors are split with ½-inch thick fibre board sandwiched in the gap. The vertical expansion joints through the external faces of the block consist of ¾ inch thick by 2-inch deep cork strip inserted in the ¾-inch joint, covered on the face by an aluminium section fixed to a hardwood strip, secured to lugs built into the brickwork. Where the expansion joints meet windows on the west elevation there are special plate mullions. All floors are 5-in. solid reinforced-concrete slabs, and lift shafts are enclosed in 5-inch reinforced-concrete walls.

3, the main elevation from the road. 4, one of the staircases from the sixth floor landing.



4



key to third floor
1, bedrooms.
2, guest rooms.

key to second floor
1, drawing room.
2, dining room.
3, lounge hall.
4, living and dining room.
5, kitchen.
6, rest room.
7, typists.
8, staff wing.

key to first floor
1, ambassador's room.
2, reception.
3, conference and dining.
4, trade counsellor.
5, secretary.
6, trade section.
7, registrar staff.

key to ground floor
1, entrance.
2, waiting room.
3, library.
4, reception hall.
5, press counsellor.
6, first counsellor.
7, first secretary.
8, spare office.
9, secretariat staff.



scale: 1/64 in. = 1 ft.
solid white walls indicate new constructions



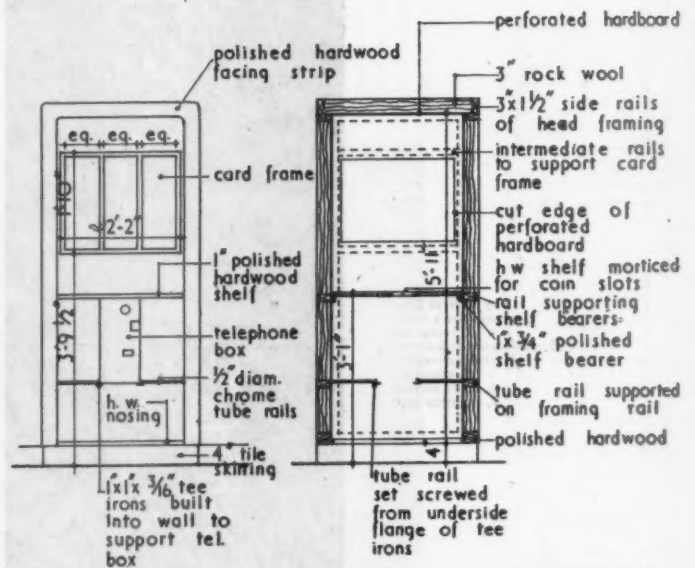
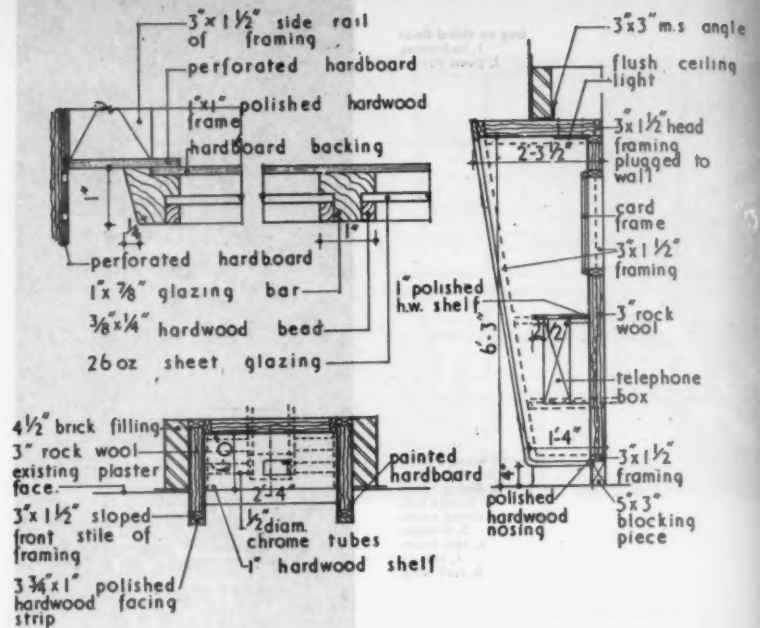
INTERIOR

IRISH EMBASSY

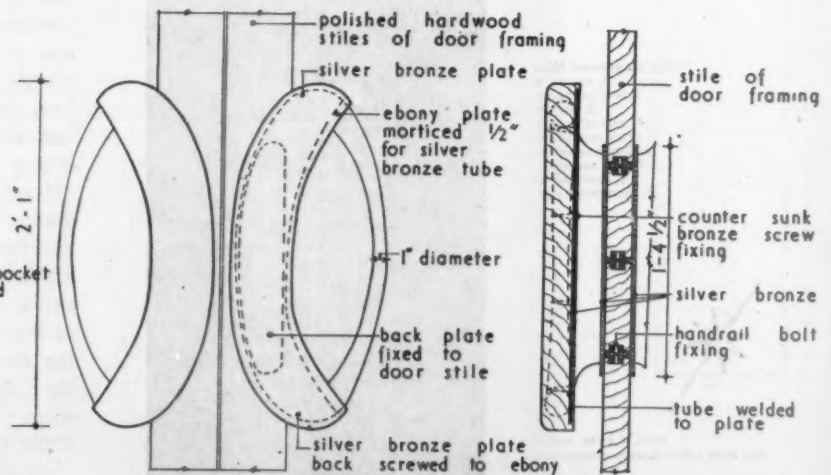
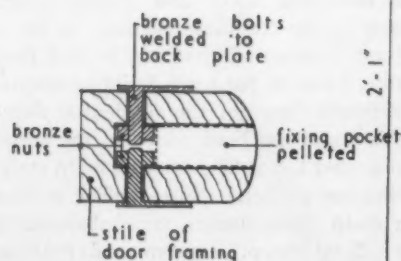
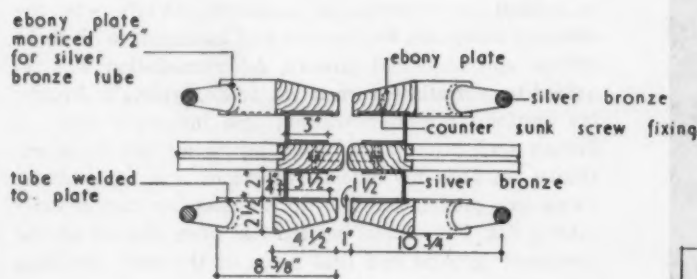
RAYMOND McGRATH: ARCHITECT
Office of Public Works, Dublin
Frank Du Berry: Assistant Architect

17, Grosvenor Place, London, acquired by the Republic of Ireland for conversion as residence and offices for the embassy comprises five storeys and basement, with three storeys and basement annexe. Accommodation was required for consulate, secretariat, trade, typists and registry sections, a public waiting and interview room, a library and information room adjoining the main entrance, an area for official receptions and conferences, living accommodation for the ambassador and a caretaker's flat. The official section has been located on the basement, ground and first floors of the main building and in the annexe; the residential section and caretaker's flat occupy the remainder. Three new staircases have been added: off the entrance hall serving ground and basement floors and giving direct and separate access to the consulate section; in the annexe serving ground, mezzanine, first and second floors for staff use mainly; and in the main building serving second, third and fourth floors of the residential section. In addition a new flight has been added in the annexe serving first and second floors. The original main staircase is retained as the main official staircase. The restored first floor of the main block houses the ambassador's private office, the official reception room, and conference-and-dining-room, or salon. Large folding doors to the reception room allow the three rooms to be arranged en suite during

receptions. The wall panels in the ambassador's room are dove-grey Irish silk poplin. The curtains are ribbed lemon-yellow poplin. The reception room is finished in pearl-grey with rubbed-off mouldings, and the salon in cream and gold leaf. The hand-woven carpets were designed by the architect. The original dining-room on the ground floor now forms three main secretariat offices and a corridor. The annexe originally comprised a large mahogany panelled room, a badminton court, garage and stables. The panelled room has been retained for staff use, the badminton court and stables accommodate messengers and porters, stores, etc., and part of the garage is used as such. A new reinforced-concrete mezzanine floor has been added for furniture depository and file storage. The large waiting room and interview office in the basement has a floor pattern of large diagonal tiles of nutmeg and chamois; the ceiling and wall behind the counter are pale blue, the remaining walls lilac. The main staircase has a Donegal hand-woven carpet designed by the architect based on motifs from the Book of Kells and the arms of the four provinces of Ireland in plaster relief on the wall opposite the official reception room. The second and third floors of the main building constitute the family residence with reception and dining areas on the second floor and bedrooms and bathroom above. The large drawing room is divided by heavy oyster-satin curtains and contains two fire surrounds in granite quarried from the Dublin Mountains. The fourth floor contains servants' quarters, caretaker's flat, and a large nursery. Servants' quarters are divided from the flat by a movable screen at the head of the domestic stairs. All plant arrangements are by the Westend Flower House. Consultant for heating and lighting was Thomas Illingworth and consultant for furnishing was F. A. Stephens.



details of telephone booth in basement (see 1 on facing page)



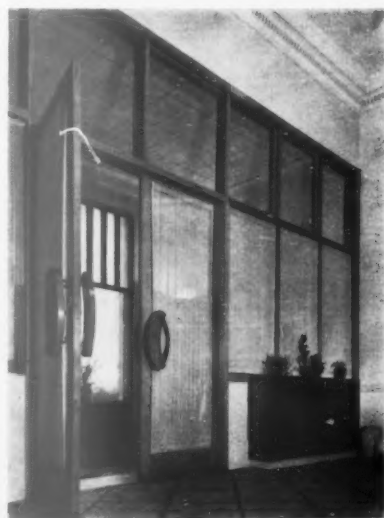
details of door handles to screen between entrances and reception halls (see 2 and 5 on facing page)



1, acoustic booth for public telephone in the corridor running beside the basement waiting room and interview office. 2, detail of handles on the doors of the polished oak and plate screen seen in 5, separating the entrance hall



from the reception hall. 3, domestic staircase on the second floor leading to the bedrooms. 4, the main staircase. The Killybegs handwoven carpet was designed by the architect and based on motifs from the Book of Kells.





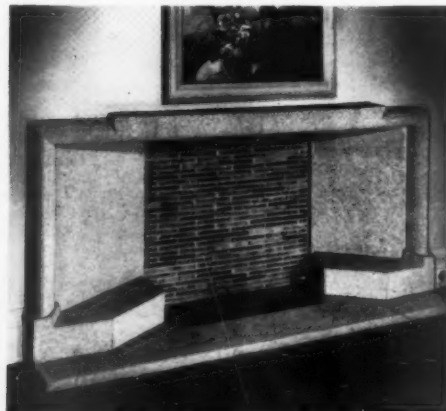
6, ground floor general office opposite the library used as a waiting room. 7, counter of the interview office. The wall behind it is finished pale blue: the colours of floor tiles are nutmeg and chamois.



8, the kitchen in the ambassador's apartment. 9, combined built-in wardrobe and wash basin fitted in all guest bedrooms. 10, fireplace in the ambassador's private office. 11, one of the main drawing-room fire surrounds of granite quarried from the Dublin mountains.

10

11



key to fourth floor
1, club room.
2, publicity office.
3, office.

key to first floor
1, ante-room.
2, board room.
3, committee room.
4, area.
5, future flat for visitors.

key to ground floor
1, entrance hall.
2, main exhibition hall.
3, permanent exhibition room.
4, dressing room.
5, fashion salon.



scale: 1/64 in. = 1 ft.
solid white walls indicate new construction

HEADQUARTERS FOR A

TRADE FEDERATION

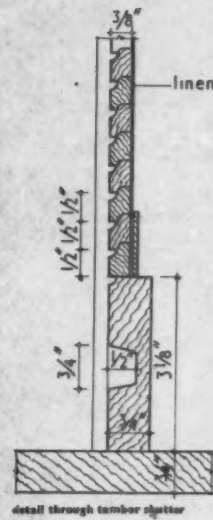
R. D. RUSSELL; DESIGNER

As London headquarters of the British Rayon and Synthetic Fibres Federation, Hamilton House (138, Piccadilly) had to provide space for exhibitions and a salon for receptions at the openings of these exhibitions; space for smaller and more intimate exhibition; a setting for dress shows with dressing rooms and seating for about 150 people; a board room and an adjacent luncheon room, with service to the latter from kitchens in the basement; a clubroom for members of the industry; and a considerable number of offices. The ground floor, with direct access from Piccadilly, was most suitable for the main exhibition space, the three rooms at the front becoming the exhibition space proper with the octagonal room at the back for receptions. Accommodation for dress shows was provided in the two south rooms, with changing rooms for models leading off the inner one. Three front first-floor rooms became ante-room, board room and luncheon room. By removal of partitions on the fourth floor the front rooms were converted into one open space for small exhibitions and the clubroom, the remainder of the house being used for offices.

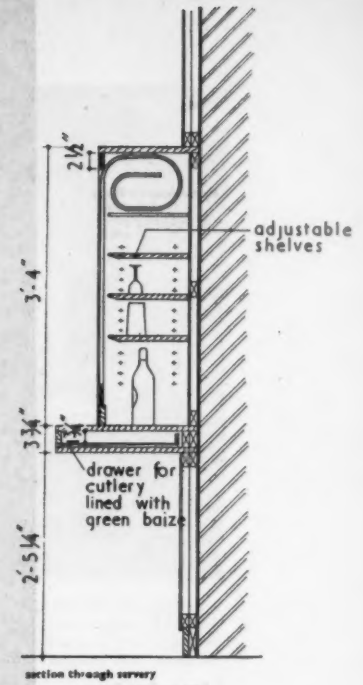
Little structural alteration was needed on the ground floor; the entrance to the south room from the hall was moved and enlarged and three doorways between this room and one immediately behind it combined into one large opening to form a curtained proscenium to the stage on which models appear at dress shows. The wall of the south room facing the entrance was panelled with moulded vertical boards of Australian black bean

INTERIOR

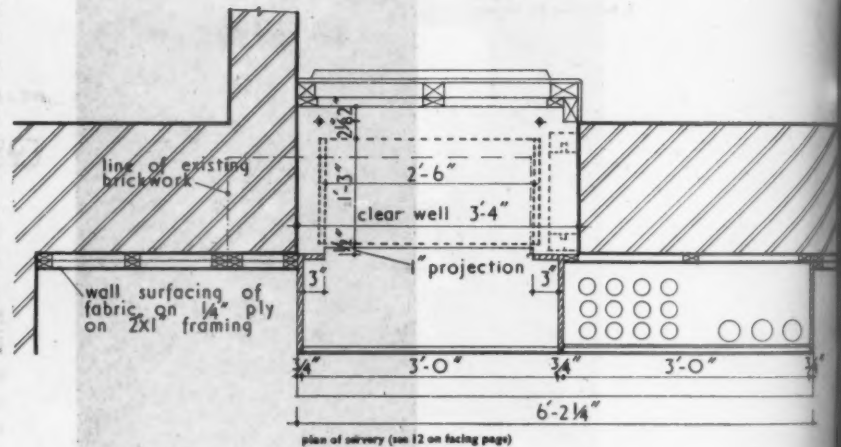
finished at the floor with black marble skirting. At the north end of this room on either side are two large open display cases backed with sand-grey woven plastic yarn, and black-bean boarding carrying through below them. The temporary raised walk-way for dress shows is lighted from spotlights sunk in the ceiling above. The square room beyond the proscenium opening is faced from floor to ceiling on both sides with mirrors which can be covered by venetian blinds, separated by vertical fins of hardwood, to which special adjustable spotlights may be attached. The carpet in the main exhibition room is seaweed brown, with a greyed olive fleck irregularly placed, designed by Marian Pepler; plaster walls and ceiling are painted dead white; shelves over radiators are blue-grey Derbyshire fossil marble; radiator covers below them are golden-brown woven cane; curtains are of wallflower red damask, lined with strong yellow. Stacking chairs and platforms of the model walk are ash, the latter covered with smoke-blue felt. Board room and luncheon room on the first floor are flanked with fabric-covered panels to form a high dado, and boldly striped curtains hang right across the window walls at both ends. The opening in the wall separating these two rooms was greatly enlarged and provided with 11 ft. high sliding doors of afromosia. The carpet is dark grey; wall panels are cinnamon; the ceiling is patterned with a grey and gold medallion on white; walls above the dado are light grey; window reveals are white; curtains are woven in very wide stripes of dark grey, oyster white, cinnamon and lime yellow. Treatment of the fourth-floor space has been kept simple, relying on the superb outlook. Window openings were enlarged to take centre-pivoted, double-glazed windows. Joinery and sand-blasted wall boarding are of parana pine and the floor is of light cork tiles. Narrow pine shelves and woven-cane radiator covers below them are suspended from the ceiling on polished brass rods. Walls and ceiling are painted white.



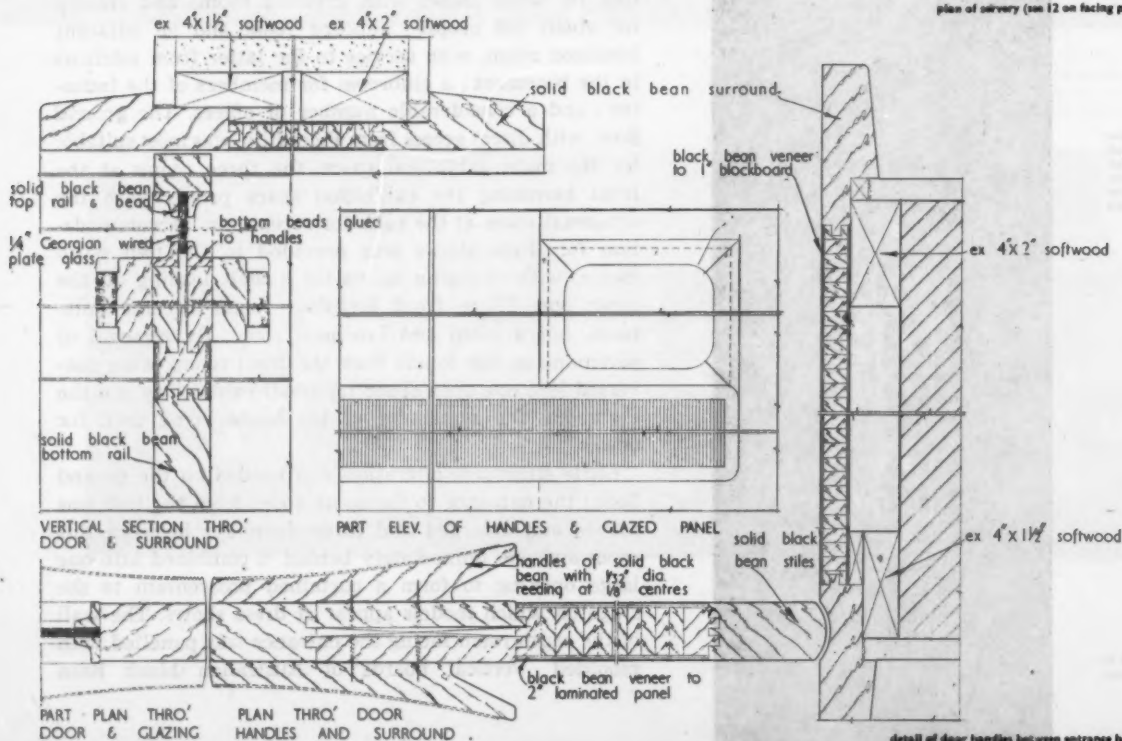
detail through timber skirting



section through servry



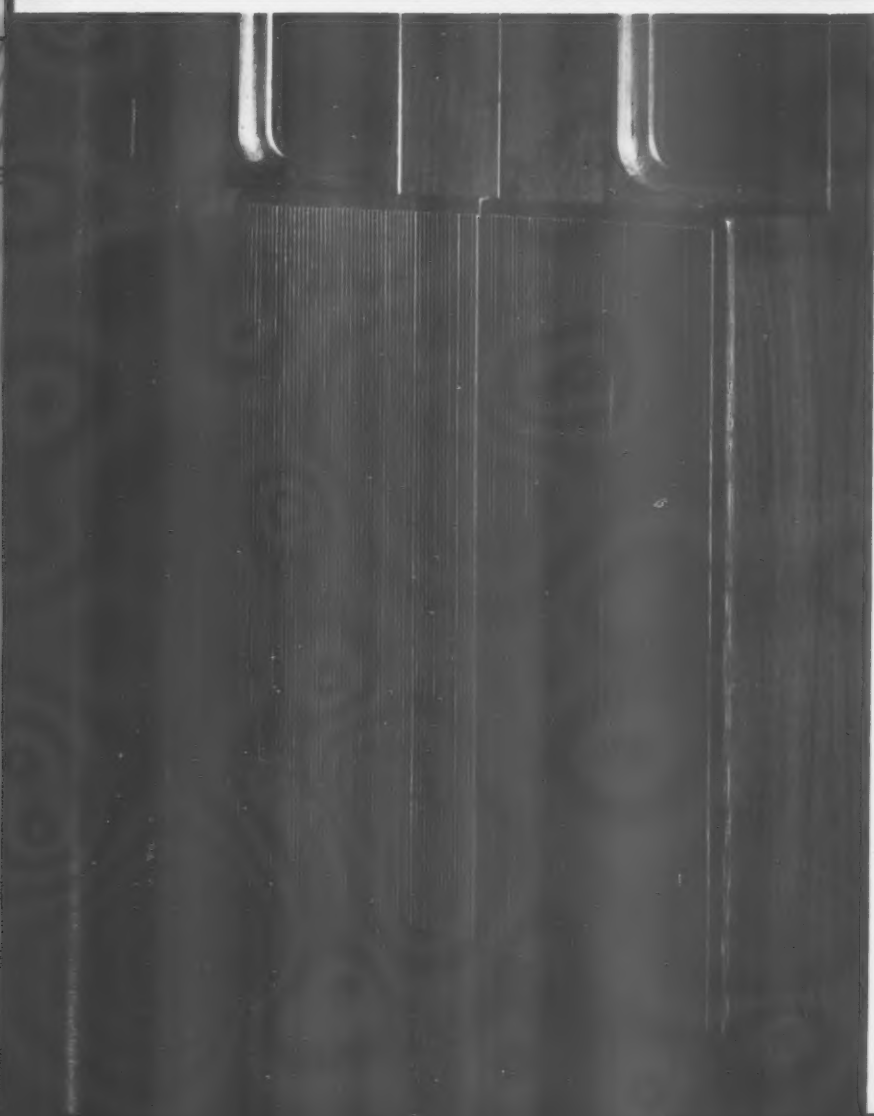
plan of servry (see 12 on facing page)



detail of door handles between entrance hall and exhibition room (see 12 and 15 on facing page)



12

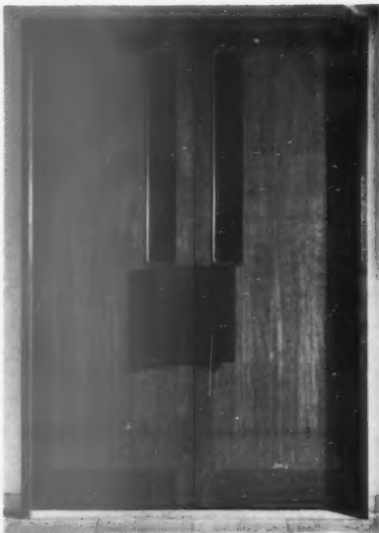


13



14

12, serving hatch in the first floor luncheon room. 13, detail of push plates on the entrance doors of the main ground floor exhibition room. 14, new main entrance from the street to the entrance hall. 15, entrance doors to the main exhibition room. 16, the doors

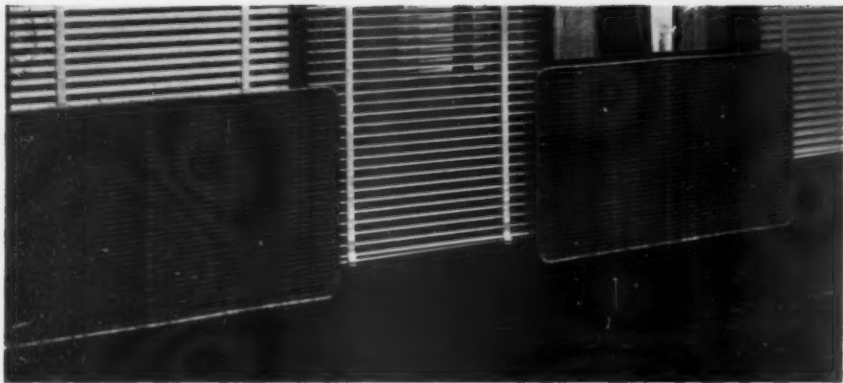


15

opened, showing the Adam fireplace set in surround of black Belgian marble. Walls are faced with black Bean vertical boarding. The carpet designed by Marion Pepler is the colour of seaweed with brown flecks.



16



17



18



19



20

17, detail of the woven-cane radiator screens in the main exhibition room, 21. 18, leaf picture by Dosia Craig above the fireplace in the main exhibition room. 19, detail of the Adam fireplace with black Belgian marble



21

surround. 20, part of the fourth-floor clubroom. The varying pitches of the low ceiling have been retained to give a penthouse character. 22, the main exhibition room before conversion and 23, after. Curtains and drapes are wallflower-red damask lined with clear yellow.



22



23

BOOKS

BRISTOL BUILT

THE GEORGIAN BUILDINGS OF BRISTOL.
By Walter Ison. Faber & Faber. 50s.
BRISTOL. By Tudor Edwards. Batsford. 9s. 6d.
OLD BRISTOL. By Lance Wright. Compton-Dando. 3s. 6d.

If the writing of architectural history has—perhaps mercifully—not yet attained the status of an academic discipline, it has nevertheless made perceptible progress since C. F. W. Dening published his *Eighteenth-Century Architecture of Bristol* in 1923. Mr. Ison himself set a new standard in accurate documentation in his *Georgian Buildings of Bath*, and even if Dening's book had not been long out of print, there would have been every excuse for a comprehensive study of the Georgian architecture of a city which was so largely built or rebuilt between 1700 and 1840, and which, even after the neglect and destruction of the present century, still contains many notable buildings of the period.

Mr. Ison's book begins with a short but valuable survey of the Georgian development, followed by biographical notes on the leading architects and master-builders. The principal buildings are then described in detail with the aid of plans, measured drawings and an admirable selection of photographs.

As a result of Mr. Ison's researches among city and parochial archives the principal personalities in the building of Georgian Bristol emerge fairly clearly, though it must be admitted that none of them was of the stature of a Wood of Bath, and that nearly all the most distinguished buildings in the city were designed by outsiders—by Wood himself, or by Londoners like Isaac Ware, C. R. Cockerell and Sir Robert Smirke. Nevertheless, the Patys maintained a high standard of design and execution in the latter part of the eighteenth century, and Thomas Paty's carving in the Redland Chapel reveals a provincial master whose work possesses the virtuosity almost of a Grinling Gibbons. The Chapel itself—though not (as Mr. Ison is careful to point out) without its defects—is one of the most complete monuments of Georgian taste in the country, and it is fortunate that the building accounts should survive in the custody of a firm of Bristol solicitors. It is on the evidence of these documents that Mr. Ison reverses the traditional attribution of the design to John Strahan in favour of William Halfpenny. It is true that in May, 1742, Halfpenny entered into an agreement with John Cossins, of Redland Court, to supervise the completion of the Chapel for the sum of 10 guineas, and that he subsequently designed some of the internal fittings. But by this date the structure must have been substantially complete, and there is nothing to show that Halfpenny had had any previous connection with Cossins.

Strahan on the other hand had designed Redland Court itself as recently as 1735, and was the architect to whom Cossins would naturally have turned when in 1740 he decided to build the Chapel. When it is remembered that Strahan was described as 'deceas'd' in 1742, the obvious inference is that Halfpenny's engagement to complete the Chapel was due to Strahan's death. What renders this still more probable is the fact that among the documents in the solicitors' office there is an undated estimate for the structure of the Chapel which is certainly not in Halfpenny's hand, and may well be in Strahan's. Until an authenticated example of Strahan's handwriting can be found for comparison, his responsibility for the design of the Redland Chapel must be regarded as unproven. Meanwhile, it is a pity that Mr. Ison did not choose to give his readers a fuller statement of the evidence on both sides. It is a pity, too, that he should make no reference to the drawings of Redland in the British Museum, which include an elevation of the house by John Jacob de Wiltstar, showing it before the original design was obscured by later alterations, and a delightful view of the interior of the Chapel dedicated to Cossins himself. These are *minutiae* of architectural scholarship which do not seriously affect the value of the book as a record of Bristol's Georgian architecture. There is, however, one omission which does: for the reader will search in vain for any reference to the classical tower and cupola of All Saints Church (built by George Townesend in 1716–17 and reconstructed in its present form by Luke Henwood in 1808), which forms so striking a feature of the Bristol skyline and was regarded by Dening as one of the city's 'most cherished possessions.'

Mr. Tudor Edwards's book demands to be judged by less rigorous standards—both of scholarship and appearance—than it is proper to apply to Mr. Ison's. It is in fact a guide-book, and in spite of occasional inaccuracies and a tendency to journalese it fulfils its purpose well enough. The 51 photographs illustrate most of the city's principal buildings in a straightforward manner, and the index appears to be comprehensive and accurate. For the intelligent visitor, however, it would be difficult to improve on Mr. Wright's *Old Bristol*, which is written with distinction, agreeably printed, and provided with what both the other books under review lack—a plan of the city which is on a sufficiently large scale to be legible.

Howard Colvin

MINIATURE AMAZON

TIME ON THE THAMES. By Eric de Maré. Architectural Press. 21s.

I have a personal interest in the engaging proposal which is the burden of Mr. Eric de Maré's guinea's-worth. From the casements of my sixteenth century manor house in the

Cotswolds, I look out on fields on which, it has been asserted to me, I know not on what authority, there were flowing, in time past, the headwaters of the Thames. At the present time, these headwaters are generally understood to be situated either at Thames Head near Cirencester or at Seven Springs, three miles or so from Cheltenham. Mr. de Maré concurs with Leland, 'Isis . . . three myles from Cirencester within half a myle from the fosseway.' His book has grown out of the author's plea, in a special issue of *ARCHITECTURAL REVIEW* two years ago, 'to preserve the . . . valley of the Thames for its whole length as a . . . Linear National Park'. From Teddington to Cricklade is 135 miles. A riverside walk along the distance is probably coming. A matter of thirteen thousand feet of route at about forty points has still to be made because of erosion and crumbling of banks. Ferries or footbridges, wherever possible at locks, must also be established. But to Mr. de Maré this is only half measures. The region is 'relatively unspoilt, it is picturesque and it offers facilities for boating, sunbathing, camping, for the study of nature, archaeology, history, architecture and painting' (see Mr. de Maré's pictures) 'and for reading, talking and love-making.' He does not say bathing. He does say fishing, but I am not one of those whose notion of enjoying the open air and scenery is to kill something. Hear him again, however, on his Linear Park—'unique because of its winding . . . its sense of remoteness and by its sudden swift surprises,' 'a kind of miniature Amazon in the heart of England.' For details see the book, which is variously and generously illustrated and praiseworthy for the information packed into it as an all-the-way guide book for intelligent people, the right kind of map on the end papers (so that it cannot blow about in the breeze) and for the careful arrangement and typography which make the volume so easy for reference to things of interest or beauty, in or near the river, as one boats along or walks by the riverside. I spot only one omission. At Southstoke it might, perhaps, have been mentioned that at Rose Cottage—a cottage really rosebedecked, but now bearing its old name of Panters—there lived for some years my old colleague Sir Edward Cook, editor of the *Pall Mall Gazette* and *Westminster Gazette* and author of the 'Life and Works of Ruskin' in 39 quarto volumes.

J. W. Robertson Scott

ROME OR THE EAST?

ROMAN SOURCES OF CHRISTIAN ART.
By Emerson H. Swift. Columbia University Press (London: Geoffrey Cumberlege), 1951. Pp. xx + 248, 66 figs. in text, 48 pp. of plates. \$10.

The purpose of this book is to assess the contribution of Imperial Rome to the art and architecture of medieval Europe. Its approach to the problem may be summarized in the author's own words (page 226): 'In reply to

the well-worn question "Rome or the East in Christian Art?" the writer believes that a single answer must eventually be accepted—and this answer in unequivocally *ROME*.¹ As this summary suggests, it is a single-minded work, written with all the partisan enthusiasm of a self-confessed convert from Hellenism. It is a great pity, therefore, that the author should have chosen to simplify the problems almost out of recognition by writing in terms of controversies that are twenty-five years out of date. The oriental theories of Strzygowski, for example, no longer constitute a 'vast weight of authority which still holds the field' (page 218), and to write in such terms is to tilt at windmills. We have learnt a lot about the art of Rome and of the provinces in the last twenty-five years, and almost all that we have learnt suggests that it was an infinitely complex growth. Few scholars today would be prepared to deny that the western

half of the Empire had an important contribution to make to the art of late antiquity, although there would probably be wide difference of opinion about the nature and extent of that contribution. Professor Swift's view represents one extreme; and one cannot help feeling that, in presenting it, he has all too often allowed his judgment to be coloured by visions of the serried ranks of conservative scholarship against which he has felt himself called to testify.

The chapter on the pagan ancestry of the Christian basilica reveals clearly the dangers of so partisan an approach. To establish the western origin of a form that already in the fourth century was accepted universally as one of the two standard architectural types for Christian worship, the author has recourse to the theories proposed forty years ago by Leroux. These may be baldly summarized as distinguishing two main types of columnar or

'hypostyle' building in the ancient world, the one longitudinal and derived from the megara and primitive temples of archaic Greece, the other with its long axis at right angles to the entrance and derived from the audience halls of Egypt and the ancient east. Both types were widely represented in the classical architecture of the Roman age; but it was the former that was adopted by the architects of the early church, and thus represents 'the final and fully developed phase of a very ancient and widely diffused Western type of hypostyle edifice.' The conclusion is harmless, if faintly ridiculous in its terminology: 'Roman Basilicas of Oriental type' (fig. 21) are illustrated by three examples, all in Italy—the Basilica Julia, Vitruvius' basilica at Fanum (to which might be added the early and close parallels recently excavated at Cosa, in Etruria, and at Sabratha) and the Basilica Ulpia; whereas of the 'Roman Basilicas of Western type' illustrated in fig. 23, three are in Italy, two in Greece, one in Africa and three in Asia Minor and Syria. Within the boundaries of the Roman Empire, the geographical distinction between 'eastern' and 'western' types of basilica had ceased to apply (if indeed it had ever been valid) four centuries before Constantine. One could with greater justice argue that, in terms of contemporary architecture in the capital, the basilica with an open timber roof was already an obsolescent, outmoded form when the historical accident of its adoption by Constantine's architects gave it a new and vigorous lease of life.

The chapter on central and cruciform churches illustrates another of the pitfalls of so narrow an approach. It is common ground today that the centrally planned churches, baptistries and tombs of early Christian architecture owed a great deal to the tombs, shrines and bath-buildings of pagan antiquity. It is probably true also that the lead in exploring the possibilities of vaulting such structures had been taken by the architects of Rome and of Italy. It does not follow, however, that the vaulted, centrally planned buildings of Christian practice are all therefore uniquely attributable to western inspiration. The Hellenistic world, too, had its centrally planned buildings and these played no small part in the development of the forms current in Roman times in the eastern provinces; and even the (structurally) more advanced, vaulted types were probably a great deal more widely represented throughout the Roman world, at any rate from the third century onwards, than the author allows.

It would be wearisome to follow the argument chapter by chapter. The pattern is the same. Professor Swift has many sensible things to say, particularly on the use of colour and of the development of spatial concepts in Roman building; and had he been content to establish that Rome and the West played a great part in shaping the art of medieval Europe, this might have been an excellent book. As it is, in seeking to substantiate the claims of an exclusively Western Roman origin for the art of late antiquity, he has all too often succeeded only in obscuring Rome's real achievement, which lay in the creation of an art that in varying degrees drew upon



This relief from Dura-Europos, representing the Tyche of Palmyra, tutelary civic goddess of the Palmyrene Empire, is selected by Professor Swift, among other examples, to support his thesis that Christian Art derives from Rome, not from near-eastern sources such as this, for he finds it, unlike Christian Art, firm in the 'archaic Eastern tradition, without flatness or frontality, without any colouristic or optical qualities.'

every corner of the Empire, east and west alike, and so prepared the way for the transmission to succeeding generations of the common heritage of classical antiquity.

John Ward Perkins

SCENIC ILLUSIONS

CHANGEABLE SCENERY, ITS ORIGIN AND DEVELOPMENT IN THE BRITISH THEATRE. By Richard Southern. Faber and Faber. 63s.

Mr. Southern takes as his starting point the use of perspective scenery in the English Masque, which, introduced by Inigo Jones, marked the breakaway from the earlier permanent scene of the Elizabethans.

The intricate requirements of realistic scenery, such as we know to-day, resulted in the form of theatre known as the 'picture-frame stage', with its necessary proscenium opening, masking curtain and often costly machinery, all of which provide for the changing of scenery in a manner mysterious to, and hidden from, the audience. That the changeable nature was not always of such a negative character is one of Mr. Southern's main points, and he brings considerable evidence to show that the scenic element of the Restoration and Georgian stages was considered as a decoration of the stage area, sometimes using illustrations suitable to the general theme of a play, but being normally concerned more with theatrical fantasy rather than with naturalistic illusion. Without the restraining conventions of naturalism the scenic element was itself a protagonist in the performance, its changing elements being fully visible to the audience and its movement upon the stage forming an integral feature of the production. The forms and proper definitions of the scenery involved in the development from masque to picture frame, together with the 'grooves' which guided its movement on the stage, are all most fully illustrated both by documentary and pictorial evidence and, although the groove is treated by Mr. Southern as the 'hero of the piece,' it is perhaps to be regretted that it has at times been allowed to monopolize the situation whilst other fascinating elements of changeable scenery have been but briefly mentioned.

In view of the extremely important nature of the illustrations in such a book it is unfortunate that some confusion should have arisen in the references to plates 26 and 27, and that Mr. Southern's own sketches should be less lucid than his text. These are, however, but minor criticisms in a book of considerable value in a hitherto undeveloped field.

Richard Leacock

Shorter Notices

THOMAS TOMPION, HIS LIFE AND WORK. By R. W. Symonds. Batsford, 1951. £7 7s. 0d. Edition de Luce £14 14s. 0d.

'Tempus absolutum verum,' said a famous Scholium of the *Principia* (1687), 'of itself and of its own motion flows equably without regard to

anything external, and by another name is called duration; relative, apparent and vulgar time is a kind of sensible and external . . . measure of duration by means of motion.' In effect the great clockmakers of the Restoration treated vulgar time 'as if' it were absolute. They were passionately interested in the pendulum and its consequences, especially in escapements and cases for them. This alliance of the natural philosophy with the London trades, evident in Sir William Petty of the demotic statistics, in Christopher Merret of glass fame, in Joseph Moxon of Admiralty appointment, has been remarked more than once. By the marriage of ornament and mechanics it produced, in the long-case clock, the most majestic and beautiful of all measurements of time. Its happiest name was still to be bestowed, by a Victorian popular song.

Not least of its makers, Thomas Tompion was already called in 1842, as Mr. Symonds points out, 'the father of English clockmaking.' That title is due on the contrary to the macabre genius of Hooke. Nevertheless, the blacksmith's son, Hooke's devil and Graham's boss and Mudge's 'ancestor' was as much a success in his line as Thomas Chippendale and Robert Adam in theirs. The go-getter got away with it, at least in the esteem of his contemporaries. Mr. Symonds, perhaps for that reason, sets too much store by the individual talent and too little by the tutorial tradition. His book is not strong on the English invention of applied science, and it is weak on the art history of these new forms.

Otherwise it would be hard to praise this sumptuous quarto too highly. It assembles a great mass of detailed information about Tompion, much of it new or newly presented. It does allow contemporary regards to speak, however rhetorically, for themselves. It does quote scarce sources *in extenso*. Library numbers are given, though page references may be wanting. The 272 illustrations and the four colour plates are mostly excellent; the admirable detail photographs, especially, show how such shots can inform a subject. The watches sometimes suggest that a low multiple of micro-photography might have been used to advantage. Block-making, paper, type, though not binding, are much better than often come from Batsford. It is difficult to think that, on facts, this will not long be a standard work.

W. A. Thorpe

THE BUILDINGS OF ENGLAND: MIDDLESEX. By Nikolaus Pevsner. Penguin Books. 3s. 6d.

Hardly anything which really matters is omitted, and most of Dr. Pevsner's conclusions will be readily accepted. He has not enough space to give us much of the county's history before 1888, and its gradual deterioration due to 'the spreading of the hideous town'; but a good deal of the story comes out in the accounts of all the towns and villages which he gives in 150 pages, conveniently arranged in alphabetical order.

He naturally gives a fullish account of Hampton Court, by far the most historic and picturesque collection of buildings in the county; but he finds room to describe Boston Manor, Harrow School, Ickenham Manor Farm, Osterley, Strawberry Hill, Grovelands at Southgate, Pitzhanger Manor, Syon House and Wrotham Park in some detail.

There are not many important churches, but Hendon, West Drayton, Ickenham, Harefield, Littleton, Hillingdon, Stanmore, and especially South Mimms and Harrow receive sympathetic treatment.

Among more modern architects he mentions Sir William Tite and Basil Champneys at Mill Hill School; Norman Shaw, RA, at Harrow Weald and Bedford Park; Sir Raymond Unwin in the design of the Hampstead Garden suburb, which

we owe to the initiative of Dame H. O. Barnett; and the church of St. Jude, designed by Sir Edwin Lutyens, PRA.

N. G. Brett James

OLD FRENCH IRONWORK. By Edgar B. Frank. Harvard University Press. \$6.00.

The author of this work has been strangely irresponsible in his choice of a title. He makes no attempt to confine himself to ironwork of French origin, but includes objects from most European countries and even has a brief section on Japanese Mio Chin figures. Nor is the term ironwork strictly correct, for all kinds of small steel articles, such as table-knives, pen-knives and scissors, come within his scope. The catholicity of his taste would not by any means be a defect, if he had provided his numerous plates with captions, or even if there were a list of the illustrations. As it is, one has to hunt through the text to find descriptions of the objects illustrated, frequently in vain. This work is, in fact, a picture-book of the author's collection. It is an extensive collection, representative of the work of the locksmith, cutler, tool-maker and steel-chiseller in Western Europe from the fifteenth to the nineteenth century, though I suspect that Marcy, the notorious Parisian faker of the end of the nineteenth century, is represented also (Nos. 374 and 376). The text is reliable, though it contains nothing new; the illustrations are good if somewhat unselective.

J.F.H.

Books Received

SWEET ROMAN HAND. By Wilfrid Blunt. James Barrie. 15s.
LINCOLNSHIRE AND THE FENS. By M. W. Barley. Batsford 15s.
THE SCOTTISH ISLANDS. By George Scott-Moncrieff. Batsford 21s.
LANCASHIRE AND THE PENNINES. By Frank Singleton. Batsford. 15s.
THE WINDOWS OF KING'S COLLEGE CHAPEL. By Kenneth Harrison. Bentley House. 10s. 6d.
THE LAW RELATING TO THE ARCHITECT. By E. J. Rimmer. Stevens. 35s.
DESIGN POLICY IN INDUSTRY. The Council of Industrial Design. 3s. 6d.

HISTORY

THE COST OF BUILDING AN EIGHTEENTH-CENTURY PRIVATE CHAPEL

In a long series of account books in the Essex Record Office and relating to the Du Cane family, are the details of the cost of erecting a private chapel at Great Brawted, Essex. As many churches possess similar private chapels of a fairly late date, the building accounts of one of them may be a guide for others. The chapel is referred to in The History of Essex by A Gentleman (Peter Muilman) who writes in 1769:—

'There has lately been built by the owners of the Lodge a very good room adjoining to the church, with a fire place for their accommodation when they attend divine service; and underneath this room



Braxted Lodge, near Witham, Essex, home of the Du Cane family.

is a vault intended as a burying-place for the family: it is at present quite empty; and as the family it is intended one day to contain, are worthy and well-disposed, we shall be happy to find it for many years to come in its present unoccupied state.'

Just under three-quarters of a century later, the Rev. Alfred Suckling referred to 'the erection of a huge and ugly red brick appendage on the north side of the nave' and went on to 'proclaim how totally taste must have vanished from both clerical and lay proprietors in Braxted.'

So much for the divergent opinions of two Essex antiquaries. Most ecclesiologists and other visitors to the church would probably agree that this red brick addition, built between 1761 and 1762, does not blend faultlessly with a rubble-walled church that is predominantly of the twelfth and thirteenth centuries. Externally, the east and west walls of the chapel are quite plain except for a moulded stone string-course below the battlements. The north wall has a window of three cinque-foiled lights with tracery in a two-centred head set beneath a gable terminating with a stone cross. For the first five feet from the ground, the walls project slightly on all sides, and this plinth is furnished with dressed stone on the upper face. From the inside of the church, the room (21 feet by 14 feet) is entered through a stone arch with a four-centred head almost spanning the entire width. Three steps lead to the floor which slopes away from the nave, the north end being some five feet higher than the nave floor. On the walls are eleven memorial tablets, and the plastered ceiling, following the shape of the arch, is divided into five bays by wooden ribs

resting on carved wall-plates. The seating, arranged on three levels, consists of sturdy oak benches.

The building accounts begin in June, 1761, when Peter Du Cane paid £18 14s. 0d. to Roger Altham 'for the Expence at Doctors Commons in procuring a Faculty.' Next comes the actual cost of erection, and the items given below are shorn of their contractions and unimportant repetitions; the dates are those when payment was made.

	£	s.	d.
1761			
June 18 Henry May for 24 Flag Stones he bought for me		1	12 0
June 23 Samuel Humphreys (per Wm. Wright) for 15,000 Old Bricks @ 14s.	10	10	0
Oct. 26 John Bartholomew for Stonework round the Building		9	12 6
Nov. 26 William Wood			
26,200 Bricks	26	4	0
7,000 Tiles		5	12 0
293 Bushels of Lime		7	14 0
William Wright			
3,000 Bricks & Carriage		3	12 0
150 Cornish Bricks			
[?Cornice bricks]	1	5	0
Martin Lane			
Lead		8	17 0
Glass		1	9 0
Work &c.		10	6
Charles Malyon & Robert Kemp			
Digging 139½ yds. foundation	3	9	9
16 Rod 74 feet Brick Work at 1s. 7d.	21	19	0
6 Square 68 Feet Tiling at 3s. 6d.	1	3	0

Work to Church Roof	2	0	
Hair & Work to Ceiling, & putting a first Coat on the Walls, &c.	2	0	3
Jonathan Harwood for Blacksmiths Work	2	1	0

1762

Jan. 12 James Browne for Making Co[u]nters for the Vault, Timber & putting on a Roof, Making & putting up Doors to the Vault & Room. Making & putting up a Sash Window, & flooring the Room	54	18	0
Sept. 4 Edmund Cross for 8 Chairs		4	0 0
Oct. 16 John Greenwood for a Tin Fender			7 6
Oct. 27 J. Harwood for Iron Rails to the Steps		6	4 0
Nov. 10 Charles Mallyon, Bricklayer		8	12 0
Nov. 15 M. Lane, Glazier		5	18 3
Nov. 17 W. Wood for Tiles and Lime		1	19 8
Nov. 19 J. Bartholomew for Stone Steps	10	11	0
Nov. 20 Robert Kemp, Bricklayer		2	1 0
Nov. 23 James Browne for Making a Sach & front to Enclose the room from the Church & other work done there			24 2 4
			226 6 9
Add cost of faculty			18 14 0
Total			£245 0 9

Peter Du Cane's annual analyses of expenditure enable us to prove that no items have been omitted from these figures.

The vault was entered from the west side, steps now under the vestry floor near the fireplace leading down to a massive oak door which gave access to a large chamber fitted with open shelves to receive the coffins. All signs of the fireplace in the chapel have disappeared, but it was probably on the west side and destroyed when the new vestry was built or when the church was 'restored' at the end of last century. Other alterations since Peter Du Cane's day are the insertion of the three-light window in the north wall in place of James Browne's sash window, and the removal of the sash and screen which separated the occupants of the chapel from the rest of the congregation.

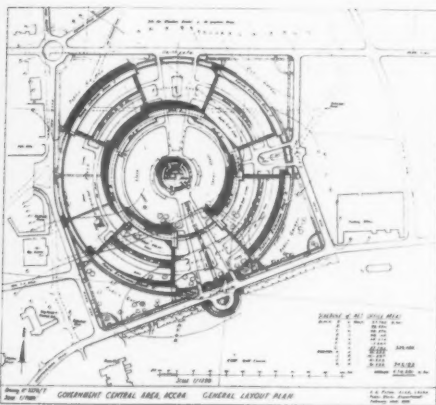
Muilman's hope that the vault would remain unoccupied for many years was realized. Peter Du Cane did not die until 1808 at the age of ninety, and he was the first to be buried here.

F. W. Steer

WORLD

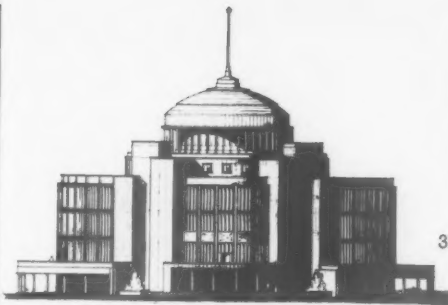
GOVERNMENT CENTRE AT ACCRA, GOLD COAST

The impression that official architectural taste in West Africa has taken a dramatic turn for the better needs to be tempered by a consideration of buildings such as the New Government Centre at Accra, 1, which shows that the change of heart is by no means complete. Designed by A. G. Paton for the Gold Coast Public Works Department, it hardly measures up to the



problem of creating a building capable of symbolizing the New Order in the Commonwealth. Aridly geometrical planning, 2, which recalls the barren avenues of New Delhi, is mated with Edwardian concepts of monumentality which do not accord very well with crudely exposed lift-shafts, brise-soleils, and other features of mid-century commercial building in the tropics, 3.

Provision for air conditioning etc. appears to be excellent so that failure to take advantage of natural methods of sun-control, such as proper orientation, impossible in this scheme, is of little con-



sequence, but the highly axial planning seems to invite aesthetic disaster if the peripheral extensions have to be built separately, rather than all at once. Had a more liberal and asymmetrical type of planning, like that of Le Corbusier's scheme for Chandigarh, been adopted, piecemeal expansion would have been possible without visual disorder.

P.R.B.

INDOOR PLANTS

ELETTERIA CARDAMOMUM (Zingiberaceae)

This evergreen perennial has only recently been reintroduced into this country as a room plant. It is a native of India, but it was, and perhaps still is, cultivated in Jamaica and the East Indies as an economic plant. It is the true cardamom plant, its seed capsules yielding a spice which is extensively used in Scandinavian countries in cakes. Cardamom is only obtainable here from a few of the more expensive grocers.

Although it was first introduced into this country in 1811 under the name of *Alpinia Cardamomum*, probably as a curiosity to be cultivated as a hotbed exotic, it must have lost favour fairly rapidly since information about its culture

is now difficult to obtain. Experience of the year-old potted specimens now with suppliers show it to be fairly tough and hardy if used only as a foliage plant. Stove heat is probably essential for its cultivation if flowers and seed are required.

Its foliage is handsome though not particularly distinguished. The leaves if rubbed will leave a fairly strong scent of



cinnamon on the fingers. It requires a shady position, moist soil, a rather rich mixture of peaty sand would be suitable, and it can be propagated from root divisions.

H. F. Clark

TOWNSCAPE

THE CAMPIDOGGIO: A CASE STUDY

The architect has a responsibility toward the landscape, which he can subtly enhance or impair, for we see in perceptual wholes and the introduction of any new building will change the character of all the other elements in a scene. The Campidoglio in Rome has been injured through ignorance of this principle. A study of maps and drawings of its changing setting shows a group of buildings in themselves not significantly altered, but nevertheless revealing variations in expression and quality.

Michelangelo's design of the Campidoglio itself can be considered as an enhanced setting for the senatorial palace which was in existence in the mid sixteenth century, 1 and 2. This he modified almost negligibly by the application of the pilasters, entablature, and window architraves. It was by means of the flanking



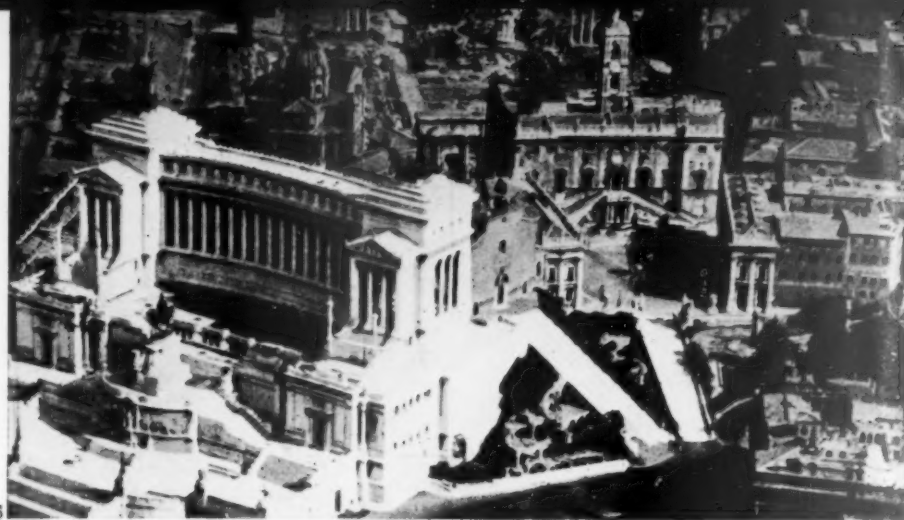


1



2

buildings, 3, their form and position, that the senatorial palace acquired new value. The contrasting elements of their colour and texture, and the neutral, even rhythm of their columned façades gave emphasis to the palace. Their unique positional arrangement created direction and an illusion of increased size; moreover, it



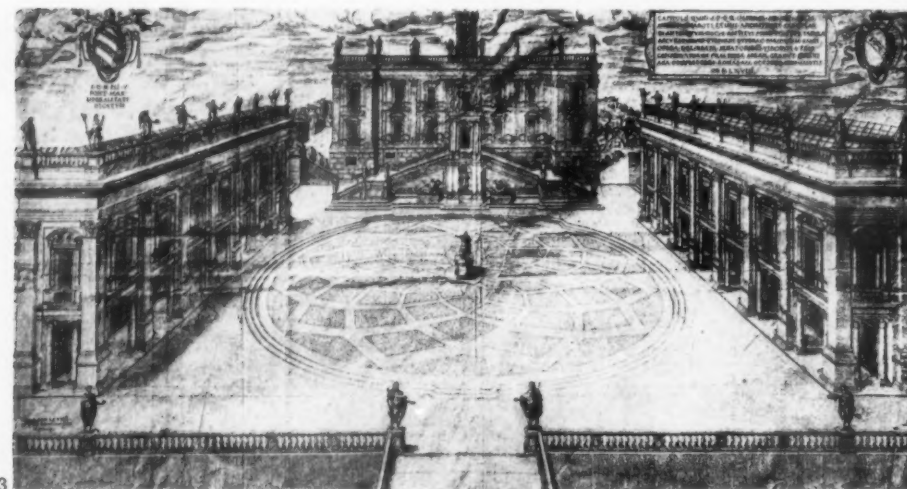
5

concern itself not so much with its form (which can appeal to one's sense of the grotesque), but with its effect on its architectural neighbours. By its size, scale and colour, it makes the Campidoglio a weak anti-climax. Furthermore, the monument's direction, 5, creates for the Campidoglio a backstage position and causes it to lose any meaningful relation as capitol to the city plan.

Similarly drastic in effect was the sub-

stitution during Mussolini's era, of big boulevards and unenclosed spaces of monumental parks, 6, for the intricate, small-scale neighbourhoods composing the original setting. The complex formerly afforded views tantalizingly interrupted with rich, unaffected architectural foregrounds. The experience of small spaces achieved by contrast an effect of power for the Campidoglio piazza when it was

Robert Venturi



3



4

gave a controlled approach to the palace, 4, which contributed to its monumentality. The piazza which they form created an enriched space for the palace.

Since the end of the nineteenth century one has had to approach the Campidoglio group with eyes straight ahead, preferably equipped with blinkers. At the left and always influencing one's image looms the Victor Emanuel Monument, ludicrous in itself, but catastrophic in its effect on the neighbouring Campidoglio. In fact adverse criticism of the shiny monster should

stitution during Mussolini's era, of big boulevards and unenclosed spaces of monumental parks, 6, for the intricate, small-scale neighbourhoods composing the original setting. The complex formerly afforded views tantalizingly interrupted with rich, unaffected architectural foregrounds. The experience of small spaces achieved by contrast an effect of power for the Campidoglio piazza when it was



6

reached. The removal of the congested areas was of doubtful social advantage, and the substitution of the fragmentary highway, of no real value to the overall

REMBRANDTISM, OR THE POWER OF THE MAW

'After size and weight, the Power of architecture may be said to depend on the quantity (whether measured in space or intensesness) of its shadow . . . so that Rembrandtism is a noble manner in architecture, though a false one in painting.'¹ Whether or not you agree with Ruskin's views on painting, here is an important truth which modern architecture disregards at its peril. These six photographs show architectural Rembrandtism achieved through the use of one particular device, the large and dark or deeply shadowed opening; let us agree to call it, for brevity's sake, the *maw*. All six are of urban scenes, for it is in urban architecture that the maw has a special value: owing to the limited number of angles from which it can be viewed the town building is rarely apprehended as the three-dimensional thing it is, and the maw has the effect of opening up the façade and suggesting the inner reality—suggesting, note, not expressing or displaying, for it is part of the potency of the maw that there is an element of mystery about it, so that it invites the eye to pause while the mind speculates. Broadly speaking, maws in the townscape are of two kinds: monumental and incidental. The first two here—1 is at Tar-

¹ The Seven Lamps of Architecture, 'The Lamp of Power,' section XIII.



1

ragona, Spain, and 2 at Verona—belong to the monumental category; they dominate the open spaces before them and offer to swallow the passing people like



2

whales so many planktons. The rest are all incidental maws, from Holland, 3, France, 4, Spain again, 5, and England, 6. The Dutch scene, 3, is specially interesting because it demonstrates the immense power the maw has of attracting the eye: once you have looked at the black openings in the warehouse on the left it is exceedingly hard to concentrate on anything else in the picture. 4 is important because it shows a maw in the functional tradition,



3



4



5

produced with the lightest of structural materials; and look how effectively the darkness is emphasized by the contrast of the white signboard (which does double duty, aesthetically speaking, by establishing a human scale for the entrance at the same time).

For moral, and for a working rule in this matter of maws, one cannot do better than



turn back to Ruskin. 'The architect's paper lines and proportions are of no value; all that he has to do must be done by spaces of light and darkness; and his business is to see that the one is broad and bold enough not to be swallowed up by twilight, and the other deep enough not to be dried up like a shallow pool by a noonday sun.'²

M.W.

² Op. cit.

DESIGN REVIEW

MORE DOOR HANDLES

It is evident that new ideas in door-handle design must come from the architect and designer if any progress is to be made. The design of such equipment must be regarded as an important part of the design detail in any normal job, where the average trade product is not enough.

That there is plenty of scope for new ideas was implicit in H. McG. Dunnett's recent survey on Door Furniture.* Some new Swedish designs illustrated in a recent number of *Byggmasteren* suggest that original thought in contemporary terms is still very much alive there. The first two are from a motor showroom designed by Gösta Wiman at Nyköping. They are both

* A.R. August, 1952.

for inside doors, not front doors. 1 is in 4 mm. brass sheet on a wood-framed, glass door. It is a very ingenious but simple piece of fabrication, the sort of thing that could



be stamped out in thousands. There is very simply a shaped piece of flat brass sheet with a hole cut out of the centre. It is bent round the door frame so that there is a wing either side of the door. The two flaps are then bent over outwards and the two slim parts are countersunk into the outer edge of the door. The handle below, 2, is made from two sections of shaped hardwood, sandwiching a plate-glass door.



The circular part is a push handle, the other is a pull handle. Fabrication is less simple than in the first example, yet not complicated when carried out in wood.

Illustrations three and four are of handles in the advertising studio of a firm in Stockholm, designed by Arne Rudberger. 3, showing the front door, has a dome of clear plastic overlapping a run of jacaranda wood which provides a lip for pulling from the inside. This does not seem an entirely practical solution, though it is a stimulating idea. In 4 the push-plate is



elaborated into an abstract symbol in teak embracing the mirror-glass door, logical enough as a decorative feature. 5, more modest in character, somewhat formalized



in contrast with the others and, if anything, a trifle flimsy in effect, is designed by Basil Spence and made by Bell, Donaldson & Co. for the Natural Philosophy department extension at Glasgow University.

Cheap Domestic Hot Water

THE FACTS OF A SECONDARY SYSTEM

Every home fitted with a solid fuel water heating apparatus also needs a secondary system. In the summer it is uncomfortable and extravagant to have a fire going to provide intermittent hot water in the kitchen, where it is constantly in demand. Even in the winter the supply from the solid fuel system falls short of kitchen needs unless fuel is burned briskly most of the time.

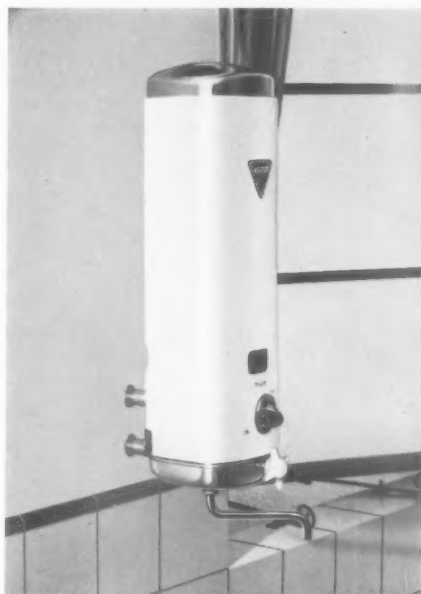
There is no necessity for the secondary system to provide a bulk supply, as the demand for large quantities of hot water for bathing is pre-arranged in the majority of homes. What is absolutely necessary is an instant supply at the kitchen sink for washing-up, washing clothes, toilet purposes, bathing the baby, cooking and domestic cleaning.

Gas, used in one of the Ascot sink water heaters, provides such a service. The Ascot water heater only uses fuel while the hot water is actually being drawn, and heats just the amount of water required for each job, so there is no wastage. The instantaneous heater

has a high rate of efficiency and is very economical. It neither divides its heat output between water heating and space heating, nor wastes by-products of coal distillation up the domestic chimney.

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An Ascot installation using the Jigged Wall Fitting

before occupation, this can be done at any time in a few minutes without disturbing or affecting the decorations. Architects, surveyors, builders and housing authorities are invited to investigate this simple and inexpensive method of providing a secondary hot water system. Their attention is drawn to the facts that it creates no peak-load problems, and that a supply of piping hot water is always available day and night, winter and summer, at the turn of a tap.

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QUANTITY & QUALITY

... The recent changes in modern architecture are perhaps as basic as those separating the nineteen twenties from their predecessors. True that we share our vocabulary with this period of yesterday but the same words have for us a different and often a basically opposite meaning. We also speak of functionalism, but then it meant the exactitude and now it means the flexibility. Those are two opposite concepts. In our thoughts priority often is given to the psychological and not the physical human function. The concept of a short lived structure removed with the rapid change of technology is replaced by a notion of architecture that will be our contribution to the life of future generations. Le Corbusier introduces a measure on which this contribution can be composed, the 'modulor' with its mystery of the golden section. This measure of good proportion is most significant for the change of values. No longer the measure of functional space, no longer the measure of time, but a measure of beauty. Whatever the validity of such a measure may be it is interesting to notice that in the sequence of 'time, space and architecture' the emphasis is shifting towards the last word in terms of the mystery of its art. The free plan is replaced by the modular plan. Again these are two opposite notions. A module is the most rigid discipline to which a plan can be subjected. A modular plan in reality is the opposite of a free plan. We are no longer preoccupied with the proximities of related functions but with the nature of space that leads from one function to another. It is no longer 'how quickly to get there,' but 'how to get there,' that matters most in our plans. It seems that from a quantitative period we have jumped into a qualitative one. . . .

From *Origins and Trends in Modern Architecture*, by Matthew Nowicki. Quoted in *Roots of Contemporary American Architecture*. Edited by Lewis Mumford. Reinhold Publishing Corp., New York, 1952. P. 416.



chiefly in Dublin. Married Mary Catherine Crozier, of Dallas, Texas, in 1930. Has one son, Norman, a budding engineer and one daughter, Jennifer Ann, amongst other things a blossoming musician. Has mellowed somewhat in the Celtic twilight but has many ambitions, most modest of which is to design a perfect concert-hall and have a free hand to embellish it.

Architect of Headquarters for a Trade Federation (see pages 325-328). RICHARD DREW RUSSELL is professor of the school of wood, metals and plastics at the RCA. He studied at the AA, then joined his brother's



firm and has been in private practice since 1936. Joint architect with R. Y. Goodden, of the Lion and Unicorn Pavilion, South Bank Exhibition, and with Goodden and Richard Guyatt responsible for the display in that building. Married to an architect and rug designer, Marian Pepler, with whom he likes to work in informal partnership on interiors. One daughter, Sarah, aged 13 years, two sons, Daniel 12 and Richard 9. Lives in a tall, Victorian gothic doll's house in Putney with the making of a fine garden which he enjoys

MARGINALIA

This Month's Anthology

The late Matthew Nowicki was in many ways, though not the obvious ones, a true heir of Frank Lloyd Wright, and if one compares this month's anthology with *Against the Steam-roller* on pp. 283-285, one will find that both are discussing, though from viewpoints nearly three generations apart, the same fundamental problem, which is difficult to name, but has to do with the place of conscious aesthetic expression in contemporary architecture. Or, in other words, with the uses of monumentality, whose traditional modes and forms Frank Lloyd Wright has never fully abandoned, and which Nowicki, reaching back over the Internationalist generations, was able to take up and redevelop from the point at which the older master left them.

Architects in this Issue

Architect of Irish Embassy (see pages 321-324). RAYMOND McGRATH is architect-in-charge of the Office of Public Works, Dublin. Was born in Sydney in 1903 and graduated in architecture in the University School in 1926. Came to Clare College, Cambridge, as Wentworth Fellow in the following year and began a friendship with 'Manny' Forbes which culminated in 'Finella.' Was in private practice in London for ten years, first as consultant for the studios in Broadcasting House, later work including: Froggnal House; St. Ann's Hill, Chertsey; Land's End, Gaulby; Fischer's Restaurant; Kingstone Store, Leicester and plans for the Aspro factory. Is the author of *Twentieth Century Houses* (Faber and Faber, 1934), and with A. C. Frost of *Glass in Architecture and Decoration* (The Architectural Press, 1937). Has designed carpets, fabrics, wall-papers, glassware and furniture. Is a painter in watercolour, gouache and oils, exhibiting

working on. Particularly delighted by some eighteenth and nineteenth century ornament, and by the chance of using it in contemporary interiors.

St. Ann's, Manchester

An appeal has been launched for the restoration and rehabilitation of the church of St. Ann, Manchester. Dedicated in 1712, it is, like so many others, traditionally attributed to Wren, or a Wren pupil. There may be some substance for this, as the building has certain affinities with the church at Ingestre, which is a fairly probable product of the Wren office. St. Ann's is, in any case, a pleasant and dignified representative of a rare kind of church, outside London—the early-Hanoverian. Its restoration will be an expensive affair, since the very stonework has been rotted by the corrosive atmosphere, and there is a good deal to be done inside as well. Subscriptions and enquiries should be sent to the Hon. Treasurer of the Appeal Fund, Williams Deacon's Bank Ltd., St. Ann Street, Manchester, 2.

INTELLIGENCE

Mr. Ashley Havinden has been elected President of the Society of Industrial Artists in succession to Mr. Lynton Lamb.

The Department of Landscape Architecture in the College of Architecture at Cornell University offers a Fellowship of one thousand dollars for the academic year 1953-4. Inquiries to Dean Thomas W. Mackesey, College of Architecture, Cornell University, Ithaca, New York.



WALTER GROPIUS, foundation member of CIAM, reorganizer of the Bauhaus, the most distinguished architect-refugee to pass through England, revitalizer of the School of Design at Harvard, will celebrate his 70th birthday on May 18, and remains one of the most influential figures in modern architecture.

CORRESPONDENCE

Inigo Jones

To the Editors,

THE ARCHITECTURAL REVIEW

SIRS,—The sympathetic and very fair criticism of the Inigo Jones exhibition held in December at the RIBA, which appeared in your February issue, calls for one comment. Your critic considers that this was not a representative exhibition, and that the aspect of Jones's 'output which suffered most was the Costume drawings for the Royal Masques.' I fear that the suffering of this aspect is inevitable in any Jones exhibition, since all, or nearly all, his surviving sketches for masque dresses are mounted in two small folio volumes. Through the generosity of the Trustees of the Chatsworth Settlement and of the Duke of Devonshire, both these volumes were lent for the exhibition, but it is impossible to display more than one page of each at a time. The others were in fact physically present, so to speak, but invisible. There is a similar difficulty in exhibiting the remarkable collections of Jones drawings belonging to Worcester College. Most of the more interesting architectural drawings are bound in two enormous folio volumes, one of which was most kindly loaned by the College, but owing to its unwieldy size proved impossible to display satisfactorily. I feel that these facts should be known, since similar problems will arise in a future Inigo Jones exhibition, whether large or small.

Yours, etc.,

JAMES C. PALMES,

London.

RIBA Librarian.

Hastings Old Town

To the Editors,

THE ARCHITECTURAL REVIEW

SIRS,—As an ex-resident of Hastings I must protest strongly against the so-called restoration of certain houses in the Old Town. I had not visited the Old Town for some time, and I was appalled to find the lower part of All Saints' Street transformed into something resembling Walt Disney's 'Snow White and the Seven Dwarfs.'

All the 'wealth of olde oake beames' and other treatment which one would normally associate with road-house architecture of the thirties are in evidence and the whole character of the Old Town is in grave danger of being lost.



The character of the Old Town is essentially eighteenth century, in the nautical tradition, and the charm of the area is derived from the white-washed brick and weather-boarding of the period.

The local authority has powers under the Town and Country Planning Act to prevent inharmonious development, and it is up to the residents of Hastings to make sure that these powers are used or the Old Town will be gradually turned into a 'Tudor-bethan' desert.

Yours, etc.,

JAMES WYATT.

Epsom.

To the Editors,

THE ARCHITECTURAL REVIEW

SIRS,—I have noticed an error in the January 'Coronation' issue of the REVIEW.

Figure 8 on page 42 is described as a photograph of the Temple choir. I recognize it as a pre-war photo of the children of the Chapel Royal, St. James's, in their traditional costume.

The only unusual feature of the Temple choristers' vestments was the very voluminous nineteenth century style surplice, almost as long as the cassock, which was split in the front and buttoned at the neck.

Although choristers of a Royal Peculiar, I believe, their cassocks were sombre black until 1937 when new scarlet ones were obtained for the Coronation. Ruffs were never worn at the Temple, just very deep Eton collars and never bow ties.

Yours, etc.,

East Barnet.

DAVID LEWER.

EXHIBITIONS

All the pre-Columbian work in the Mexican exhibition at the Tate—the lovely archaic pottery, with its references to snake markings and human breasts, the fantastically inventive and humorous figurines from the cultures of Western Mexico, the refined naturalism of Olmec, Zapotec and Huastec, the organic abstractions of Toltec, the highly civilized art of the Maya, with its classic and baroque periods, the brutal assertiveness of the Aztec—affirm a spontaneous genius for sculptural form. Under Spanish imperialism this genius was reduced to a prodigious craftsmanship, and the room devoted to the colonial, eye-rolling saints had an atmosphere of brutal prettiness more gruesome than the Aztec obsession with skulls. In our time, the Mexicans have turned to painting, and their pictures at the Tate were colossal in size, brutal in subject, hysterical in mood.

It would be nice to think that the intense pleasure afforded by the pre-Columbian sculpture was due to its formal attributes, but I have my doubts. The silver and copper coins which piled up each day in the hole scooped out of the limestone stomach of 'Chac Mool,' a Maya rain spirit, were probably intended as thankofferings for a new aesthetic experience, but if this tribute-money had been turned into fruit, flowers and cages of small birds, and placed before the images responsible for our elation, we might have witnessed a spectacle which bore a suspicious resemblance to snake-worship. The coiled stone snakes were not spot-lighted, and were dumped around like useless lumber, but they are so imbued with a casual, aristocratic ferocity that they look like the lords of creation, and made the rest of the monumental sculpture seem almost vulgarly ambitious. This image is mysterious in its simplicity; it is no more than a magnified naturalistic representation of a coiled snake, but it is a masterpiece of iconography, endlessly repeatable and requiring no genius in the carver to sustain its force. Its geometrical basis is a blunted cone, and when the Aztecs used this form for the human figure, as in the



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He also selected Warner modern-weave "Marple Spot" in cinnamon for the Committee Room walls and

chairs. Both fabrics were designed by Marianne Straub, F.S.I.A. and were woven in

spun rayon, cotton and worsted.



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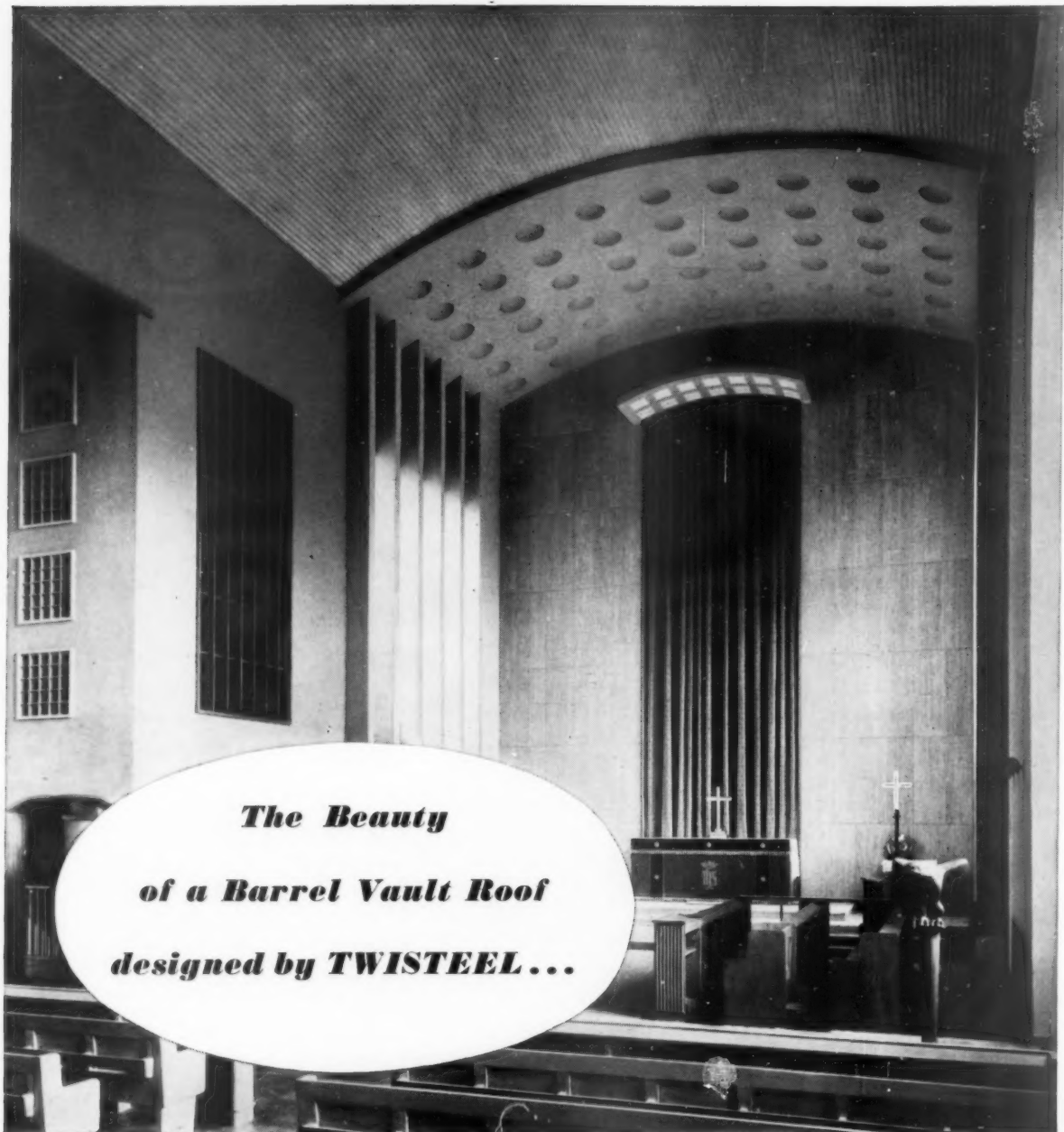
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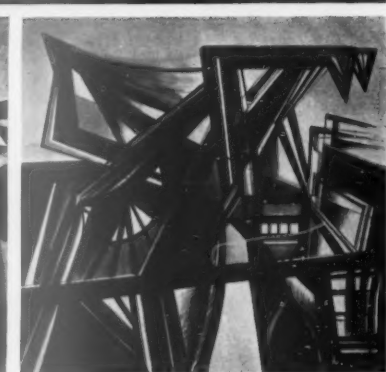
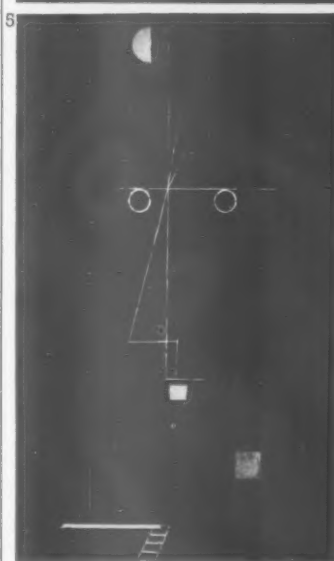
MISCELLANY

squatting spirit of women who died in childbirth, or in the image of a man compressed into the shell of a tortoise, the effect is unspeakably horrible.

The famous 'Chac Mool' is disappointing—an unspirited embodiment of a great sculptural conception. It is a semi-reclining figure, raising itself on its elbows, but the arms are mere reliefs on the sides of the body, the drawn-up knees are without tension, the carving of features and decorations have no finesse: perhaps it is one of many repetitions. Fortunately there were smaller works which offered conclusive evidence of the wonderful dignity and refinement of Maya sculpture, including a stucco mask which must be one of the greatest male portraits of all time, rivalling the finest of Roman heads.

The exhibition of 'The Wonder and Horror of the Human Head' at the Institute of Contemporary Arts in Dover Street would have achieved the massive and overwhelming effect of the Mexican exhibition if all the works which were represented by photographs could have been there 'in the flesh.' The subject is inexhaustible, and Mr. Roland Penrose, who collected the images, and whose interesting essay, bearing the title of the show, has just been published by Lund Humphries with many illustrations, was compelled through lack of space to eliminate the portrait from his survey. Even so, he brought together well over two hundred images connected with the symbolic and personifying uses to which the human head has been put in the arts of painting and sculpture. The geometrical section alone, which was probably the mildest of them, gives some idea of the explosive juxtapositions encountered throughout the show: in this section there were simplified cycladic heads; featureless, egg-like heads which were sinister in the paintings of Chirico, serene in the sculpture of Brancusi; ferociously inventive tribal masks; examples of analytical cubism; Durer's experiments with architectural heads; and Klee's exquisite 'Portrait of an Acrobat' in which the lines defining the head also refer to performances on the high wire. Miss Lee Miller added a group of popular images which included some astonishing recrudescences: a French poster for a hair-tinting preparation, a double-headed, dark and fair image of a girl, formed a bizarre link with a Byzantine triple-headed Christ, and the poster of a girl wearing a huge camera and staring through its lenses was an enormity which brought to mind a Zapotec funerary urn at the Tate, of a head burdened by immense decorations. A word must be said in praise of Mr. Richard Hamilton's skilful display of extremely heterogeneous material: the pictures and painted objects at his disposal were used in a masterly fashion to break up the battleship grey of massed photographs.

It was rather a pity that the maquettes of the 'Unknown Political Prisoner' for the International Sculpture Competition, another ICA show, had to be exhibited at the Tate while the Mexican show was there. It is not easy, even with the proper facilities, to make an enticing arrangement of a host of small models more or less uniform in size, and it seems clear that the organizers were given few oppor-



3, Funerary Vase by Zapotec; 4, Small seated female figure (both Mexican Exhibition, Tate); 5, Portrait of an Acrobat by Paul Klee; 6, Vultus Triflorans, corbel from Salisbury Cathedral (both Wonder and Horror of the Human Head, ICA); 7, Moonlit Landscape II by Alan Reynolds (Redfern); 8, Warfside Construction—morning by Merlyn Evans (Leicester).

tunities for spectacular display in rooms where even the pictures from the Gallery's permanent collection were not taken down. An international jury awarded the first prize to Reg Butler, whose maquette was reproduced here in March. In this maquette, Butler has reverted to the romantic constructivism of his first forged iron style, and its size gave him no opportunity for the plastic treatment of iron

which distinguishes his later work. It must be considered as no more than the barest outline for the final work, which will be on a colossal scale. In gaining the opportunity of carrying out his imaginative project, Butler is engaging himself in the most difficult task that has yet been set for a twentieth-century sculptor, but he has the constructional knowledge and the creative energy to see it through.

Alan Reynolds, who has just held another dazzlingly successful show at the Redfern, introduces abstract elements into his landscapes with a virtuosity which intensifies his neat, poetic treatment of the English scene. Moonlight, or the diffused radiance from a cloudy sky, and a general air of contented melancholy emerge from his extensive use of dark green and black.

Merlyn Evans at the Leicester Galleries invents industrial buildings and warehouse interiors which seem dedicated to anxiety and ill-will. His forms sometimes strikingly recall the 'cubist managers,' burdened by heavy constructions, which Picasso devised for the ballet *Parade*, which in their turn recall the Aztec monolith of Coatlicue. Evans has a sombre vision, and his insets of bright colour do not give his pictures warmth, but are sudden eerie lights cast upon the treacheries of his black scaffolding.

Robert Melville

TRADE & INDUSTRY

New G.E.C. Showroom in Cardiff

The satisfactory display of lighting fittings is always a difficult problem. The ideal way to show them is in surroundings similar to those in which they will be used, but the need to show a considerable range often results in a tangled forest of conflicting designs. In their new showrooms at Cardiff, the General Electric Company Ltd., Magnet House, Kingsway, W.C.2, have evolved a contemporary interior to show off their latest range of contemporary fittings and evidently have solved the problem very effectively, despite the limited space available, its awkward shape and the fact that the showroom is a basement.

By introducing a second floor level, a dummy-window with an enlarged photograph to simulate a view, positioning the ceiling and wall lamps carefully and keeping, in the main, to natural colours

and textures for the wall decorations and furnishings, a pleasant, liveable, even spacious effect has been achieved. GEC are indeed to be congratulated on carrying their contemporary design policy so effectively beyond the West End of London.

A New Electric Cooker

Manufactured by British National Electric, Charlton, S.E.7, and featured at the Ideal Home Exhibition, this model C49 electric cooker is presented as a 'de luxe' model at what is a moderate price, £33 14s. 6d. for the cooker, with a grill and two boiling plates. With one boiling plate only it is 2½ guineas cheaper and the conversion is easily made from the smaller to the larger capacity. The cooker has one of the largest ovens of any domestic electric cooker—13½ inches high, 13½ inches wide and 15 inches deep—a hot cupboard beneath the hob, and a storage drawer is optional for fitting beneath the oven. Special attention has been given to ease of cleaning. The hob, or top plate, hinges up and the hot plates and grill boiler, together with supporting members, are quickly removable, leaving rounded corners and accessible surfaces. The oven door opens downwards, providing a shelf beneath the oven, which is equipped with automatic temperature control.

Construction is of high grade iron castings for the frame and hob, the chassis is of mild steel angle and the panels of sheet steel. Dimensions are 36 inches high, plus 9 inches for the splash plate, 21 inches wide and 21 inches deep and accord with BSS No. 1195 which conforms with standard built-in kitchen equipment.

De La Rue Ceronation Kitchen

Pursuing their policy of demonstrating the eminent suitability of Formica for working surfaces in the home, De la Rue organized a design competition for architects last January for a small working kitchen.

The prize-winning design, by a group of two architects, Percival Howells, Peter J. Ball and a student, Kenneth G. Dines, was built as part of the De la Rue stand at the Ideal Home Exhibition last March. The conditions required competitors to restrict themselves to designs suitable for an average housing estate. Formica was required only for



De La Rue kitchen

working surfaces and for the top of a utility type table, but a De la Rue G4 gas cooker was to be included. The maximum size was limited to 110 square feet, two doors were required together with sink and draining board, otherwise competitors were free in the matter of layout and provision of cupboards. Some fifty per cent of designs were eliminated by being much too expensive to install.

The winning design is a neat compact straight forward solution, economical in initial cost and easy to maintain. A little colour could perhaps have been used to brighten it up without adding to the cost.

A New Range of Vitreous Sanitary Ware

The advantages of vitreous china over other materials for sanitary ware are due to the fact that it is a homogeneous material, is non-absorbent and will not craze.

Edward Johns & Co. Ltd., Ringley, Staffs, manufacturers of 'Armitage Ware' have recently announced the marketing of a new range of plumbing fixtures in 'Armitage Genuine Vitreous China,' particularly for use in hospitals, schools, hotels and similar establishments. Its heavier construction than normal earthenware renders it very suitable for heavy duty and hard wear, while the lower maintenance costs and improved hygienic qualities are added advantages.

The Armitage No. 4000 'New Elitex' wash basin recently introduced and incorporating a dip on the front edge, which serves primarily as an 'anti back syphonage' feature, is now available in vitreous china in sizes 22 inches by 16 inches and 25 inches by 18 inches.

Manufacture of the vitreous china ware is made possible by a big re-construction in the factory, so that the 'Armitage Ware' earthenware continues in full-scale production, to satisfy the demand for this established, lower-priced product. Both types of ware are available in pure white and in the full range of Armitage colours.

Focus on Lead

Formed fifteen years ago as an information bureau, the Lead Industries Development Council was established by a group of manufacturers acting collectively to disseminate authoritative technical information on the uses and applications of lead in building. By 1940 the Council had achieved a wide distribution of information sheets and booklets.

Since 1945 a new set of information sheets, a handbook for plumbers, and various booklets on special subjects have been made available, forming an up-to-date body of reference to the use of lead sheet and pipe. These publications are available free of charge from the Lead Industries Development Council, Eagle House, Jermyn Street, London, S.W.1, to architects, surveyors, builders, plumbers and other building technicians.

The Lead Technical Information Bureau is also available to answer particular problems on the use of lead sheet and pipe, and will, if necessary, arrange for a technical representative to visit a site.

The education of student technicians is also an

[continued on page 342]



G.E.C. showrooms at Cardiff.

BISON FLOORS AND ROOFS IN HERTFORDSHIRE NEW SCHOOLS

TYPICAL ARRANGEMENT ON HILLS FRAME



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EDINBURGH: Sighthill Industrial Estate, Edinburgh.

SPECIALISTS IN PRECAST FLOORING SINCE 1919

continued from page 340]

important task and the Council supplies schools with wall charts and other material and arranges lectures, demonstrations, the loan of films and provides funds for prizes open to national competition. The Council also subscribes to the British Non-ferrous Metal Research Association to further scientific research on lead and its alloys.

New ICI Synthetic Fibres

By the time these notes appear, the BIF will be in full swing at Earls Court, Olympia and Castle Bromwich. A new departure for ICI at Earls Court is their appearance in the textile section, where they feature their two new synthetic fibres—'Ardil,' a fibre regenerated from the protein of the groundnut and 'Terylene,' a polyester fibre derived from oil.

'Ardil' possesses considerable versatility due to its warmth, softness and luxurious 'handle,' which it imparts to blends with other fibres. Examples of upholstery and curtain fabrics in various blends are shown, together with carpets in blends of 'Ardil' and wool. There are also many applications for dress wear, mainly as suitings and outer wear.

'Terylene' which makes a very strong yarn either as filament or staple fibre is shown made up into a wide variety of lighter garments in the former type, and into suitings and knitted wear in the staple fibre. Its industrial uses include ropes, sails, nets and coverings for fire hoses and for electrical insulation.

Also at Earls Court is their Lightning Fastener display, the Chemicals Division is showing at Olympia and at Castle Bromwich are the Plastics Division and the Metals Division stands.

Leather for the Time-Life Building

One becomes so conditioned to synthetic materials that it comes as a pleasant shock to be faced suddenly with the full appearance and even smell

of the real thing. 'Vellox,' the trade mark applied to high quality cow-hide upholstery leather made by Handford Greatrex Co. Ltd., Walsall, Staffs., was used in various ways in the Time-Life Building as a means of emphasizing the product of a typical English craft, since the achievement of a contemporary English interior was an underlying aim in the design as a whole.

'Vellox' leathers are produced in a variety of colours and the manufacturers can in addition meet special requirements. The natural grain in the leather is uncorrected in any way so as to ensure long-wearing qualities. The finish is spot-proof so that the leather may be cleaned, if necessary, by carefully wiping it down with alkali-free soap and water.

Other grades manufactured for use on furniture are 'Veltan,' 'Carlen' and 'Hand Buffed.'

Booklets Received

The Use of Welding in Steel Building Structures, brochure No. 6 of the British Constructional Steelwork Association, Artillery Row, S.W.1, gives guidance on the design of metal arc-welded steel building structures under nominally static loading conditions, made in mild and high tensile steels and designed as simple frames.

Painting Practice for Aluminium, Information Bulletin No. 20 of the Aluminium Development Association, 33 Grosvenor Street, W.1, deals, in the light of significant advances, more fully than was possible in Bulletin No. 13 with this aspect of surface finishing of aluminium and its alloys. Price 2s. on request.

Blinds, Curtains, Shutters. A catalogue of equipment manufactured by Tidmarsh & Sons, Laycock Street, N.1, for inside and outside use.

Announcements

Robb's Cement Enamel Finishes Ltd., announce that their Head Office address is now 245 Vauxhall Bridge Road, London, S.W.1. Telephone: Tate Gallery 0091-2.

Celotex Ltd., announce the election of A. Dawson, ACA, the Company Secretary and of P. W. Porter, AMInstBE, Works Manager, to their board of Directors.

Ian Henderson Ltd. announce that early in May they will, in association with Nicholls & Jones Ltd., be opening new Showrooms and Offices at 184 Sloane Street, S.W.1.

They plan to establish this showroom as a 'Furnishing Centre' where contemporary furniture, textiles, carpets, wallpapers and light fittings can be viewed in a wholly contemporary setting. Ian Henderson Ltd. will also comprise a Contract Department for the execution of special work to the designs and specifications of architects.

Power Stations

Illustration 11 on page 232 of the April REVIEW was of Doncaster power station, and not Marchwood.

Time-Life Building

The chairs in the Director's office (illustration 13) were incorrectly attributed to R. D. Russell. Mr. Russell was, in fact, responsible for the hide covered chairs in the Reception room.

Consulting engineers responsible for the foundations and retaining walls of the Time-Life Building were omitted. They are Andrews, Kent & Stone.

CONTRACTORS etc

Irish Embassy. Architect: Raymond McGrath (Office of Public Works, Dublin). Assistant Architect: Frank Du Berry. Heating and Lighting: Thomas Illingworth. Furnishings: F. A. Stephens. General [continued on page 344]

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continued from page 342]

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Koch & Son; D. Burkle & Son; Hawes & Murray. Steel furniture: Roneo Ltd.; Tan Sad Chair Co.; Sankey Sheldon; Metal Utilities. Linoleum: Barry Ostlere & Shepherd. Carpets (hand made): Mortons, Killybegs; Dun Emer Guild Ltd. Carpets (machine made): Jas. Templeton Ltd.; Navan Carpets Ltd.; Madden Industries. Upholstery: J. V. Bowden Ltd.; Hilton Bros.; A. E. Chapman, Son, Ltd. Fabrics: Richard Atkinson & Co.; Old Bleach Furnishings; O'Reillys; Morton Sundour Fabrics; Gainsborough Silk Weaving Co.; Cottage Industries. Beds and bedding: Hilton Bros.; Dunlop Co.; Staples & Co. Carpet planners: James J. Skellern & Son. Glassware: Waterford Glass Co. Table lamps and shades: Irish Shades and Lamps. Linen: Walpole Bros. Blankets: Providence Woollen Manufactory Ltd. China and pottery: Mintons; Terrybaun Pottery. Plants: Westend Flower House Ltd.

Headquarters for a Trade Federation. Interior designer: R. D. Russell. General contractors: Russell Bros. (Paddington). Sub-contractors and suppliers: Electric installation: Grant & Kent Ltd. Heating and hot water: G. N. Haden & Sons. Light fittings: Courtney Pope (Electrical) Ltd.; Fluorel Ltd.; Troughton & Young Ltd.; Merchant Adventurers Ltd.; World-Wide Superlight Co. Carda windows: Holcon Ltd. Sliding door gear to boardroom: E. Hill Aldam & Co. Marble specialists: J. Whitehead & Sons. Ironmongery: A. J. Binns Ltd. Venetian blinds: J. Avery & Co. Furniture: Russell Furnishings Ltd.; Finnmar Ltd.; Design Furniture Ltd. Carpets: A. F. Stoddard & Co.; Carpet Trades Ltd. Woven from yarn supplied by: Courtaulds Ltd.; British Celanese Ltd. Curtains and fabrics: Courtaulds Ltd.; Arthur Sanderson & Sons; Warner & Sons Ltd.; Fothergill & Harvey Ltd. Canework: G. W. Scott & Sons; J. Collins & Sons. Adam fireplace in exhibition hall: C. J. Pratt. Chandeliers in exhibition hall: Mrs. M. E.

Crick Ltd. Mirrors in exhibition hall: Jeremy Ltd. Zebra rug in entrance hall: Rowland Ward Ltd.

County Offices and Council Chamber, Dolgelly, Merioneth. Architect: Norman L. Jones, County Architect. Contractors: Aluminium buildings: The Bristol Aeroplane Company (Weston) Ltd. Central heating: Saunders & Taylor Ltd. Fire resisting floors and roof: Tarmac Ltd. Wood block floors: R. W. Brooke & Co. Terrazzo floors: Terrazate, Portmadoc. Reconstructed stone dressings: Empire Stone Co. Electric lighting and power installation: Jones Bros. Aluminium windows: Gardiner Sons & Co. Sanitary fittings: Rowe Bros. & Co. Lock and door furniture: Lockerbie & Wilkinson (Birmingham) Ltd. Furnishing of Council Chamber and internal woodwork of centre portion: George M. Hammer & Co. Asphalt roof and plastic floor tiles: Penmaenmawr & Trinidad Lake Asphalt Co. Rubber floors: Semtex Ltd. Carpets: Ffestiniog Carpets Ltd.

Flats at Hatfield New Town. Architects: Lionel Brett and Kenneth Boyd. General contractor: H. C. Janes Ltd. Quantity surveyor: Davis, Belfield & Everest. Sub-contractors: Tiles: Marley Tile Co. Slates: Turner Asbestos Cement Co. Reinforced concrete: Trussed Concrete Steel Co. Bricks: A. H. Herbert & Co. (Rustic multipressed facings): Woodside Brickworks (Croydon) Ltd. Patent flooring: New Floor Installations Ltd. Central heating: Ideal Boilers & Radiators Ltd. and Rolyat Tank Co. Grates, sanitary fittings: B. Finch & Co. Casements: Geo. Jennings-Hamer Ltd. Door furniture: Yannedis & Co. Metalwork: A. E. Cooper & Co. Joinery: H. C. Janes Ltd. and J. Sadd & Sons. External rendering: A. H. Butcher.

Workshops at East Ham, London. Designers: Brian Colquhoun & Partners, Consulting Engineers. Chief architect: A. H. Shearing. Resident engineer: [continued on page 346]



Council Chamber, County Council of Merionethshire, Dolgelly. County Architect: Norman L. Jones, F.R.I.B.A.

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continued from page 344]

G. D. McFarlane. *Quantity surveyors*: Stanley Griffith & Partners. *General contractors*: Sir Robert McAlpine & Sons. *Sub-contractors*: *Dampcourses*: George Callender & Co. *Asphalt*: Rock Asphalte Co. *Facing bricks*: High Brooms Brick & Tile Co. supplied by Wiggins-Sankey, Ltd. *Structural steel, metalwork*: Redpath Brown & Co. *Special roofings*: Robertson Building Service. *Roofing felt*: The Ruberoid Co. *Partitions*: Roneo Ltd. *Patent glazing*: Aygee Ltd. (vertical glazing); Faulkner Greene & Co. (northlight glazing). *Woodblock flooring*: National Flooring Co. *Patent flooring*: Johnson Flooring Co. *Dome-lights and glass concrete construction*: Lenscrete Ltd. *Acoustic tiling*: Horace W. Cullum Ltd. *Painting*: E. H. Bull & Son. *Road finishing*: General Asphalt Co. *Vertical linings*: Tenteest Fibreboard Co. *Asbestos sheeting*: W. M. Walker & Co. *Flush doors*: Venesta Ltd. *Expanded metal*: supplied by R. Passmore & Co. *Concrete standards*: Concrete Utilities Ltd. *Pumps*: Worthington-Simpson & Co.; Pulsometer Ltd. *Motors*: Lancashire Dynamo & Crypto Co. *Fans*: Keith Blackman Co.; Matthews & Yeates Ltd. *Lighting fittings*: Simplex Electric Co.; Electric Depot Ltd.; Ediswan Ltd.; Troughton & Young Ltd.; Walsall Conduits Ltd.; General Electric Co.; The Benjamin Electric Ltd.; Metropolitan Vickers Electrical Co. *Switchgear*: William White (Switchgear) Ltd. *Cables*: Craig Park Cable Co.; W. T. Glover & Co. *Unit heaters and panels*: Copperad Ltd. *Electric wiring*: Barlow & Young, Ltd. *Ventilation*: Benham & Sons. *Plumbing*: Stitson, White & Co. *Sanitary fittings*: John Bolding & Sons. *Door furniture*: Alfred G. Roberts Ltd. *Casements*: Mellows & Co. *Rolling shutters*: Haskins. *Joinery*: P. H. Barker & Son. *Tiles*: Carter & Co. (London). *Clocks*: Gents Ltd. *Paint*: W. & J. Leigh & Co.

Asbestos sheeting: Universal Asbestos Co. *Concrete paint*: Jos. Freeman & Co.

Flats in Ilford, Essex. *Designer*: L. E. J. Reynolds, Borough Engineer and Surveyor. *Senior assistant architect*: H. B. N. Nixon. *Assistant architect-in-charge*: R. C. Edleston. *Quantity surveyors*: Walter W. Green & Partners. *Clerk of works*: A. N. Sherring. *Contractor's site agent*: J. Warren. *General contractors*: Gee, Walker & Slater Ltd. *Sub-contractors*: *Reinforced concrete structure*: Trussed Concrete Steel Co. *Central heating installation, plumbing*: Z. D. Berry & Sons. *'Spruce-Throver' units, sanitary fittings*: B. Finch & Co. *Lifts*: Hammond & Champness Ltd. *Metal windows*: Williams & Williams Ltd. *Metal door frames*: Morris Singer Co. *Glass louvered windows, staircase handrailing*: G. Johnson Bros. Ltd. *R.c. treads, r.c. staircase windows and r.c. rear balcony grilles*: J. A. King & Co. *Wood louvers to balcony grilles, kitchen equipment*: Peerless Built-in Furniture Ltd. *Water heaters*: Ascot Gas Water Heaters Ltd.; Ewart & Son; De la Rue (Thomas) & Co. *Rubbish chutes*: Broads Manufacturing Co. *Flush doors*: Trudoors Ltd. *Dome lights*: T. & W. Ide Ltd. *Cork floors (in flats)*: Mundet Cork Products Ltd. *'Accotile' floor (landings)*: Neuchatel Asphalte Co. *Roofing felt*: Macartney Ltd. *Curtain tracks*: H. J. Smith. *Ironmongery*: Lockerbie & Wilkinson Ltd. *Electric fire travertine surrounds*: A. Pilgrim & Son. *Washing machines*: Thor Appliances Ltd. *Terrazzo window sills, surrounds, edging, copings*: Venton Terrazzo & Mosaic Co. *Electrical installation*: L. Power & Son. *Garage doors*: Bolton Gate & Shutter Co. *Bricks, autumn facings and brick tiles*: Marston Valley Brick Co. *Paints and distemper*: Thos. Parsons & Sons. *Tiling to entrances*: Langleys London. *Paint on concrete exposed structures*: Silixine Paints Ltd. *Floor insulation*: Fibreglass Ltd.

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